Overview
Operations management is the design and management of the processes that transform inputs into finished goods or services. Operations management is one of the primary functions of a firm. While marketing induces the demand for products and finance provides the capital, operations produces and delivers the product (goods and services). It is responsible for matching supply with demand.

This course introduces basic concepts of operations management and application of the same in business practice today. We will examine theoretical foundations of operations management and how these principles or models can be employed in both tactical and strategic decision making in firms. Our aim is to (1) familiarize you with the problems and issues confronting operations managers, and (2) provide you with the language, concepts, insights and tools to deal with these issues in order to gain competitive advantage through operations.

Instructor Office Hours
I follow an open door policy. You should feel free to visit anytime. Preferably, you could email or call me before coming to make sure that I am in my office.

Course Materials
There is one required text for the course:


In addition, the course reader includes the cases and a few other readings. It is available in an electronic form at Study.Net. All other readings will be handed out in class and/or posted to bSpace. If you miss a handout, you can pick it up from the file box outside F570, which is Katherine Nguyen’s office.
Grading:
The course grade will be determined as follows:
- Class contribution (15%)
- Written assignments (20%)
- Midterm exam (25%/0%)*
- Final exam (40%/65%)*

* If you are unhappy with their midterm grade, you have the option of dropping the midterm grade and having the final count as 65% of the final grade. The instructor will automatically invoke this option at the end of the semester, if it benefits the student.

Preparation and Participation
The course is structured to require minimum readings before each session. You will be required to thoroughly prepare a case for class discussion. I am hoping for lively class discussions during the sessions. You should expect to be “cold called”. This practice is not meant to be adversarial. Instead, its purpose is to encourage you to develop the business-relevant skill of being able to think on your feet and be articulate and to prepare in advance for class and be engaged in class discussion. If exceptional circumstances leave you unprepared for a case discussion, let me know before class begins. The “class contribution” portion of your grade will be based on the extent to which you demonstrate that you are prepared, the relevance and depth of your comments (their quality, not quantity) and the degree to which you listen carefully and respond to your peers. Use of laptop computer for anything unrelated to the course during class time will adversely affect the “class contribution” portion of your grade. Failure to attend class will have the same effect.

Written Assignments
The written assignments are primarily of a “concept check” variety and are designed to make sure you are keeping up with the fundamental concepts. (So as to keep your workload manageable and to allow you to focus on building the basic intuition, the concept check assignments are intended not to be overly difficult. The midterm and final exams will require that you demonstrate a deeper knowledge of the material. All written assignments should be done in groups of no more than two (individual submissions are permitted). For group assignments, turn in only one write-up for each assignment. Submitting work bearing the name of more than one student requires that the students contributed roughly equally (a 60:40 split is acceptable, more unequal splits are not) to the assignment. Written assignments should be turned in to your instructor at the beginning of class on assigned due dates.

Study Groups
You are encouraged to form study groups to prepare for case discussions. In the past, students—especially those who said they entered the course not being fully comfortable with quantitative material—reported benefitting from forming study groups at the very start of the course.
Midterm and Final Exams
The exams will be closed notes, except for one page of formulas that you will be allowed to bring for each exam. The only electronic device you may use is a calculator. The midterm will cover the material of the first part of the course and the final will be cumulative and cover the material of the entire course. The exams will be both quantitative and qualitative and they will draw on the cases, lectures, readings, and in-class discussions. In preparing for the exam, you should anticipate that the level of difficulty would be on par with the more difficult practice problems that are provided, with some exam questions at the level of the most difficult practice problems. There are 4 sources of practice problems: (1) homeworks, (2) problems accompanying readings, (3) Sunday discussion session slides posted to bSpace, and (4) practice problem posted to bSpace (see the folders “Practice Problems for Part I of Course” and “Practice Problems for Part II of Course”). You will be responsible for details in the cases that point to and illustrate the course concepts (the purpose here is to have the exams reflect the class discussion, and to reward those who prepared for and participated in those discussions).

Sunday Discussion Sessions
The optional Sunday discussion sessions will be held on the following Sundays (1-2:30pm, C230): 1/22 (Process Analysis), 1/29 (Queueing + EOQ), 2/5 (Midterm Prep), 2/12 (Statistics Review), 2/19 (Newsvendor), 2/26 (Revenue Management), 3/4 (Final Prep). The goal of these sessions is to summarize material that we have covered in class, go over practice problems and give you the opportunity to ask questions. For each session, an outline of the topics and problems that will be covered will be posted to bSpace by Saturday night.

Laptop Policy
A mutually supportive learning environment depends on active attention and engagement. For this reason, no use of laptops or any other electronic device (e.g., smartphones, cell phone, iPad) is allowed during classroom sessions, unless stated otherwise. Violating this policy will result in a substantial penalization in the class participation portion of your grade.

Cohort Switching Policy
Please attend class with the cohort for which you are registered. Doing so facilitates (1) cohort cohesion and (2) everyone having a seat. Accordingly, switching sections is discouraged. If you must miss a class due to an emergency or unavoidable conflict, you may attend with the other cohort. In this case, just go ahead and attend with the other cohort. Contact your head GSI before the session and let him know that you are attending the other cohort. Before the start of the session that you are attending, let the other GSI know that you are joining that session. Priority for seating and handouts will go to students attending with the cohort for which they are registered.
Conduct in the Classroom
Business school classes take place in an environment that supports learning and encourages the exchange of ideas. Behavior that distracts students and the instructor negatively affects the learning environment. Arriving to class late, leaving the class early, or walking in and out of class during the class session is distracting to students and the instructor. Avoiding these behaviors shows respect to your fellow students and the learning environment. If you arrive more than 10 minutes late to a class, you should attend with the other section, unless this is physically impossible.

Emails and Modes of Communication
Email is an efficient means of communication to inform the instructor of a link to a video or article that you think may be of interest to the class, or to ask an administrative question that is not addressed in the syllabus. The instructor finds that, as a mode of communication, email tends to be an inefficient way to resolve subtle questions about concepts or problems. The instructor is happy (and, in fact, eager) to address any questions you may have of this type, but encourages you to ask in person (see the “open door” office hours policy above) or by phone, as this is much more efficient than the route of typing out lengthy emails and going back and forth. If you have questions about the course content and cannot wait to discuss them in person or by phone with the instructor, you are encouraged to contact your cohort’s Head GSI (e.g., via email).

Tutoring
Part of the responsibilities of each GSI is to be available for tutoring. If you have difficulty with the course, please reach out to your Head GSI to arrange for tutoring. In particular, if you perform poorly on the Midterm Exam or if you find that you are struggling with completing the homework assignments, then you are encouraged to reach out to your Head GSI for tutoring.
UGBA 141: Introduction to Operations Management  
Course Outline and Assignments  
(Subject to Change)  

Part I: Process Analysis

Session 1

Session 1A: Introduction

Read: Syllabus  
Cachon and Terwiesch, Chapter 1

Session 1B: Process Analysis

Read: Kristen’s Cookies Company case  
Cachon and Terwiesch, Sections 2.2, 3.1-3.2, 3.4

Discussion Questions: Read the first two pages of the Kristen’s Cookies Company case and prepare the following questions for discussion. In answering the questions, assume that the order is for one dozen cookies (with custom ingredients) and that baking trays, cooling space, and demand are plentiful.

1. Draw a diagram of the various production steps involved in cookie making (we will call this a process flow diagram).
2. How quickly can you fill a rush order?
3. How many orders can you fill in a night, assuming you are open four hours each night?
4. What fraction of the time will you be busy? Your roommate?
5. Because your baking trays can hold exactly one dozen cookies, your initial plan was to require each customer place an order for one dozen cookies. Would you benefit by requiring each customer to place an order for two-dozen cookies, three-dozen cookies, or more?
6. Are there any changes you can make in your production plans that will allow you to make better cookies in less time or at lower cost?

Session 2

Session 2A: The Service Factory

Read: Shouldice Hospital Limited case  
Cachon and Terwiesch, Section 2.6
Discussion Questions:
1. How has Shouldice designed its service process to support the value proposition it offers to customers? In particular, what process design choices contribute to high efficiency and productivity? How would you describe the culture of the organization?
2. What is the resource (or resources) that is limiting the rate at which Shouldice can serve customers? Do a back of the envelope analysis to identify this bottleneck (or bottlenecks). (Here’s a hint to get you started. The case provides some data on some of the key resources, which are required to process a patient (e.g., operating rooms). First, identify these main resources. Second, for each of these resources, calculate the capacity of the resource in terms of how many patients could be processed per week, if all that were required to process a patient was that resource. Then use this analysis to answer the question above.)
3. What are the advantages and disadvantages of each of the options proposed for increasing capacity? Develop a point of view on which option is most attractive.

Session 2B: Process Improvement – Setup Times

Read: Cachon and Terwiesch, Sections 6.1-6.3

Session 3

IMPORTANT: Change in time for Cohort 1!
Both cohorts will meet on Tuesday, January 17, 6:00pm – 9:30pm, place TBD.
(This class meeting is the makeup day for January 16 Martin Luther King Holiday.)

Session 3A: Process Analysis with Predictable variability

Read: National Cranberry Cooperative (Abridged)

Discussion Questions: In answering the questions below, ignore the light meter in your analysis. You should be prepared to write on the board at the start of class your answers to the first three questions, and you should give some thought to the last two questions.¹ You may work in a study group (two or three people is ideal) in developing answers to these questions, but each of you should be prepared to explain your answers. The production process described

¹ Comments regarding the questions: for the first two questions, you should apply the concepts we developed in the prior classes (for question 1, the process flow diagram is a little more complicated than what we’ve seen before, but the concept is the same). Questions 3 and 4 ask you to think more deeply. Instead of just applying something we’ve already done, you’ll need to think creatively about the best way to tackle the questions. This will require some time and effort, but tackling a problem like this where you have to come up with the solution approach is really the best way to learn. Put another way, if you were handed a solution approach and simply asked to apply it, the learning process would not be as enriching.
in the case is an example of a continuous flow process. If you want a mental picture of the various processing resources (e.g., the dechaffing unit), think of each resource as a unit built over a conveyor belt, with cranberries being transformed as they steadily move along the conveyor belt.

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:
   a. 16,000 barrels per day is the average of deliveries over the 20 days from 9/20-10/9
   b. Each truck carries 75 barrels on average
   c. Trucks arrive uniformly over a 12-hour period
   d. Trucks carry 70% wet berries and 30% dry berries
   e. The plant follows “last year’s schedule,” which is described as, “Trucks arrived starting at 7:00 a.m., and we only staffed the dumpers and the bins, and then started the rest of the operation at 11:00 a.m.”

2. Which resource (or resources) is the bottleneck? That is, what is the resource (or resources) that is limiting the rate at which the plant can process berries, given the current product mix of dry and wet berries?

3. How late does the plant need to be open (i.e., when does the plant shut down) during this peak season?

4. How bad is the truck delay at the loading dock during this peak season?

5. What are the basic options for improving the operation? Which options would you recommend and why?

**Turn in Before Class:** Be prepared to turn in a write-up of your answers to the first three questions for the National Cranberry Cooperative Case. The write-up should demonstrate that you thoughtfully considered the questions, but the write-up will not be graded, so you don’t need to worry about presentation. You should make a copy for yourself to reference during the class discussion.

**After Class:** To keep up with the course material (and so stay on track to be prepared for the midterm exam), you should work through the first half of *Practice Problems for Part 1 of Course*, which is posted to bSpace.
Session 3B: Responsiveness in Services: Little’s Law and Queueing Theory

Read: About Netflix
Cachon and Terwiesch, Sections 2.3, 7.1-7.6

Preparation: Read About Netflix. Our discussion will focus exclusively on Netflix’s DVD-by-mail service (we will not discuss its streaming service), so pay particular attention to how the DVD-by-mail service works. If you are already quite familiar with this, you only need to read pages four and five. One important question to assess the performance of the DVD-by-mail portion of the company’s business model is: How long, on average, do customers hold onto DVDs, and how long, on average, do DVDs sit in the company’s processing facility in between rentals? See if you can come up with an answer to this question (don’t worry if you can’t, but give it some thought; bonus participation points will be given for correct answers). For simplicity, you may assume that the average subscription plan has 1.6 DVDs out-at-a-time (for each subscribing customer), the average time it takes to ship a DVD from the company to the customer (or vice versa) is 1.5 days, and Netflix’s total inventory is 60 million DVDs (these figures are estimated based on the publicly available data). If the questions above are too difficult, answer the simpler question: How many DVDs (on average) are in transit between Netflix and its customers?

Session 4

Session 4A: Responsiveness in Services: Pooling and Loss Systems

Read: Cachon and Terwiesch, Section 7.9, Chapter 8

Turn in Before Class: Homework #1
Bring calculator

Session 4B: The Economic Order Quantity Model

Read: Cachon and Terwiesch, Sections 6.1-6.5

After Class: To keep up with the course material, you should finish working through Practice Problems for Part 1 of Course, which is posted to bSpace.

† Netflix’s library of streaming titles is much smaller than its DVD library. Although the company is intent on increasing the size of its streaming library, it has been hampered by a threatened media and cable industry which has resisted granting content licenses to Netflix for streaming.
Part II: Process Improvement and Quality Management

Session 5

Session 5A: House Building Simulation

Turn in Before Class: Homework #2.

Session 5B: Toyota Production System

Read: Toyota Motor Manufacturing, USA
Cachon and Terwiesch, Chapter 10

Discussion Questions:
1. You are Doug Friesen. What concrete actions are you going to take on Monday morning (may 4) to address the seat problem? (The case describes a series of meetings held on Friday May 1, and the exhibits summarize the information obtained through those meetings. So, please do not offer an answer such as: “I would talk to so-and-so” or “I would hold a meeting with so-and-so”. Your boss wants action.) As a more general matter, where would you focus your attention and solution efforts?
2. What is the cause of the seat problem?
3. Where, if at all, does the current routine for handling defective seats deviate from the principles of the Toyota Production System?
4. What is the real problem (i.e., the deeper underlying problem) facing Doug Friesen?

After Class: Prepare for Midterm Exam
Part III: Supply Chain Management

Session 6

Session 6A: In Class Midterm Exam

Session 6B: Betting on Uncertain Demand

Read: Cachon and Terwiesch, Sections 11.1-11.5, 11.7, 14.2

Preparation: In this and the next session we will develop a tool that will serve as the key logic for essentially the rest of the course. The material in this session is challenging. It relies on some statistical concepts and tools that were covered in your previous courses. If your memory of these is hazy, you may consult Chapters 10 and 12 of Statistics for Business, and/or Chapter 11 of Corporate Finance. These concepts and tools will be reviewed in this week’s Sunday Discussion Session, so if you have difficulty with this session, you are encouraged to attend.

Session 7

Session 7A: Supply Chain Innovation

Read: Marks and Spencer and Zara: Process Competition in the Textile Apparel Industry case

Discussion Questions:
1. How does the Newsvendor Model Apply to Zara?
2. How does Zara differ from Marks and Spencer?

Session 7B: Supply Chain Experimental Exercise

Read: Preparing for the Experimental Supply Chain Exercise

Today’s class will be devoted to a participatory simulation exercise in which students play the role of links in a supply chain: producer, distributor, wholesaler, or retailer. The class will be randomly divided into groups of four, and then the game will begin.

Comments to those considering switching sections: the simulation is set up to accommodate a maximum of 64 students; if you are the 65th student to show up to a cohort you are not registered for, you will be turned away from that cohort. (Because attendance is variable, the instructor is unable to predict whether any cohort will have more than 64 students attending.)

Bring: $5 (in the form of one $5 bill or five $1 bills)

Laptop
After Class: To keep up with the course material (and so stay on track to be prepared for the final exam, you should work through the first half of Practice Problems for Part 2 of Course, which is posted to bSpace.

Session 8

IMPORTANT: Change in time for Cohort 1!
Both cohorts will meet on Tuesday, February 21, 6:00pm – 9:30pm, place TBD. (This class meeting is the makeup day for February 20 Presidents Day Holiday.)

Session 8A: Supply Chain Coordination

Read:  Barilla Spa (Abridged)
       Cachon and Terwiesch, Sections 16.0-16.2

Discussion Questions: We will have a narrow discussion focused around the questions below, primarily question two.
1. What is causing the orders Barilla receives to fluctuate so wildly (for evidence of this fluctuation, see Exhibit 12 which shows how the orders placed by one of Barilla’s customers fluctuate from week to week)? What is the impact of these fluctuations on the operational performance of the supply chain?
2. Consider how the various constituencies would respond to JITD program.
   a. If your first name begins with A-L, put yourself in the position of a Barilla salesperson: What are the three best arguments against the JITD program?
   b. If your first name begins with M-Z, put yourself in the position of one of Barilla’s customers: What are the three best arguments against the JITD program?
   c. Everyone: yourself in the position of Barilla’s logistics group, which wants to implement the JITD program: Anticipate the arguments against the program from Barilla’s sales force and its customers. What is the best way to respond to and persuade these constituencies?

Turn in Before Class: Homework #3

Session 8B: Revenue Management

Read:  Cachon and Terwiesch, Chapter 15

Today’s class studies several revenue management tools to increase revenue in the presence of fixed capacity and variable demand.
Session 9

Session 9A: Supply Chain Demand Management; Course Summary and Review

Read:  Sport Obermeyer, Ltd. case

Discussion Questions: You should be prepared to write on the board at the start of class your answers to the first question and to articulate in class the answers for the other two questions.

1. Using the sample data given in Exhibit 10, make a recommendation for how many units of each style Wally should order during the initial phase of production. Assume that all of the ten styles in the sample problem are made in Hong Kong. Ignore the minimum order quantity constraint in your initial analysis. For this question, assume that there would be no future production for these parkas (i.e., only one production decision is taken to satisfy the demand).
   a. First, assume that there are no constraints on the total production commitment or on any individual style. How many units of each style should Wally order for the initial production phase?
   b. Now assume that Obermeyer’s initial production commitment cannot exceed 10,000 units. How many units of each style should Wally order for the initial production phase?

2. How should Wally plan the initial phase of production if a second production run is feasible later? That is, how should Wally think about what to produce early and what to produce later?

3. What operational changes would you recommend to Wally to improve performance?

Turn in Before Class: Be prepared to turn in a write-up of your answers to the first two questions for the Sport Obermeyer, Ltd. case. The write-up should demonstrate that you thoughtfully considered the questions, but the write-up will not be graded, so you don’t need to worry about presentation. You should make a copy for yourself to reference during the class discussion.

Session 9B: Course Summary and Student Presentations

The last class will be devoted to course wrap-up and several integrative student presentations on your classmates’ operations experiences.

Turn in Before Class: Homework #4.

After Class: To keep up with the course material, you should finish working through Practice Problems for Part 2 of Course, which is posted to bSpace.
## EW MBA 204: Operations At-a-Glance

*(Subject to Change)*

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<thead>
<tr>
<th>Class</th>
<th>Date for Cohort A</th>
<th>Date for Cohort B</th>
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<td><strong>Introduction</strong>&lt;br&gt;*Textbook: Chapter 1&lt;br&gt;*Other: Syllabus and Course Policies</td>
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<td><strong>Process Analysis and Process Choice</strong>&lt;br&gt;*Case Study: Kristen’s Cookie Company&lt;br&gt;*Textbook: 2.2, 3.1-3.2, 3.4</td>
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<td><strong>Toyota Production System</strong>&lt;br&gt;*Case Study: Toyota Motor Manufacturing, USA&lt;br&gt;*Textbook: Chapter 10</td>
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### Assignments

There will be five individual homework assignments and two group write-ups in EWMB 204. Assignments are due on the following days:

Homework 1 (Process Analysis) – Monday, January 23\textsuperscript{rd} or Tuesday, January 24\textsuperscript{th}
Homework 2 (Queueing Theory & EOQ) – Monday, January 30\textsuperscript{th} or Tuesday, January 31\textsuperscript{st}
Homework 3 (Newsvendor Model) – Tuesday, February 21\textsuperscript{st}
Homework 4 (Revenue Management) – Monday, February 27\textsuperscript{th} or Tuesday, February 28\textsuperscript{th}
National Cranberry Cooperative Group Case Write-up – Tuesday, January 17\textsuperscript{th}
Sport Obermeyer Group Case Write-up – Monday, February 27\textsuperscript{th} or Tuesday, February 28\textsuperscript{th}

### Key Dates

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### Midterm Exam
- Monday, February 6 or Tuesday, February 7, 2012

### Final Exam
- Monday, March 5 or Tuesday, March 6, 2012
SYLLABUS APPENDIX: RELATIONSHIP OF COURSE TO HAAS 10 CAPABILITIES

This course incorporates four of the “Haas Capabilities” that are integrated into the Berkeley Innovative Leader Development (BILD) curriculum.

**Risk selection** means choosing among alternatives under uncertainty. Because most operations decisions are made under uncertainty, risk selection is at the heart of operations. While the human mind can be quite sophisticated in thinking through issues where uncertainty isn’t present, intuition can break down rather quickly when uncertainty is introduced. In this context, models of systems provide insights for how to make decisions (e.g., how to design a service system when you don’t know when and how many customers will be showing up, how to manage a supply chain in the face of uncertain demand).

An essential issue in **problem framing** is *understanding system-level interactions*. Without a proper understanding of these interactions, one is at risk of framing a problem at too high or too low of a level. A central issue in the course is understanding these system-level interactions. For example, because process choices interact with one another, managers need to be careful about making sure that the process choices they make work well with one another. The risk to which managers are susceptible is that they hear about a successful company (e.g., Toyota) and then cherry pick ideas (process choices) employed by the company without thinking about how the process choices interact, which can result in a poor outcome.

The course touches on **adaptive governance**, which involves how decision rights are distributed. In our discussion of multi-firm supply chains, we discuss how firms can mitigate the bullwhip effect by transferring decision rights across firms (e.g., having a manufacturer like Barilla manage inventories at its distributor-customers).

Finally, the course touches on **opportunity recognition**. Zara illustrates how a firm can create value by rethinking the process by which firms create and deliver apparel. Specifically, Zara recognized the business opportunity in “fast fashion” and built an operational system that allowed it to quickly design and produce garments so as to respond quickly to fashion trends. Capturing this opportunity depended on thinking about the operational decisions that would make the value proposition possible.