

OIDD 220: Introduction to Operations Management

Tuesday/Thursday, 3:00pm – 4:20pm
350 - Jon M Huntsman Hall
(January 11, 2016)

Instructor: Prof. Morris A. Cohen
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Office Hours: Wednesdays 1:30 – 4:30 pm
and by appointment

Website: Canvas <https://canvas.upenn.edu/courses/1308998>

Teaching Assistants: Kyle Kroeger
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Office Hours: TBD
Venue: 606 JMHH

1. Course Description

This course introduces concepts of operations management and their application to solve business problems in order to enhance a firm's competitive advantage or to improve the performance of an organization. The operations function is responsible for those activities in a firm/organization that lead to the production of outputs (products) that are made available to users (customers) in order to generate value. We will examine both the theoretical foundations of operations management and how its principles and methods are employed in practice to support both tactical and strategic decision making. Real world examples are drawn from the automobile industry, fashion retailers, health care services, semiconductor, and high tech industries, among others. These examples will illustrate how companies use operations management principles to gain competitive advantage.

This course is highly recommended for students:

- Majoring in operations management
- Interested in consulting jobs in various industries.
- Majoring in other areas such as marketing, health care, sports industries and financial services, and interested in expanding their breadth.
- Majoring in engineering/science disciplines to understand the quantitative aspects of business management.
- Interested in learning about business analytics methods.
- Entrepreneurship and start-ups.

This is an introductory course for students interested in the OID track. This course can be followed by other Operations courses in Service Operations Management, Management Science, Process Management, Retail Supply Chain Management or other elective courses in OID such as Decision Making. Even if you do not plan to major in operations management, this course can be highly useful to you, primarily because it provides an overview of theory and practice that illustrates different perspectives of intriguing current business challenges and opportunities. The underlying theory we learn in this course can be applied in various business contexts that at first may seem unrelated to operations management.

Topics covered in detail are forecasting techniques, quality control and lean systems, inventory planning under deterministic and uncertain demand, queuing theory, risk pooling and supply chain risk management strategies, capacity and revenue management, supply chain coordination, sustainment and global supply chain sourcing.

The Course builds on analytical models, and includes analysis of a significant number of business cases and applications. The cases, assigned readings and material provide a supportive structure for the application of the theory developed in the course.

2. Course Logistics

Prerequisites

There are no official prerequisites for this course. A background in probability and statistics is desirable but not required; any necessary background will be introduced in class.

Course Text and Materials

- Course material will be mostly drawn from two books: *Production and Operations Analysis* by Nahmias and *Matching Supply with Demand: An Introduction to Operations Management* by Cachon and Terwiesch. Both books are on reserve at the Lippincott Library.
- The book chapters from the Nahmias text, cases, readings and other materials are available through Study.Net which is linked to the course Canvas site.

- The book chapters from the Cachon and Terwiesch text can be purchased as a custom book at the PENN book store (Cohen/Rieders, Introduction to Operations Management –OIDD 220, 2016).
- Additional reading material (articles, assignments, and lecture notes) will be posted on the course's website
- The class notes and supplementary handouts, will build on the foundational models described in the texts and will relate them to current state-of-the-art operations practice. We will also have case discussions that are based on the concepts that are taught in the course that will address current management issues and how the concepts covered in class are implemented. Several classes will include in-class problem solving.

Course website

The course website will be on Canvas. <https://canvas.upenn.edu/courses/1308998>

If you have difficulty accessing the course website, please let me know as soon as you can.

All the lecture notes and slides will be posted on Canvas. Canvas is the portal for all class communications. Please, check the site frequently for course materials and updates. In particular, you should always refer to the web site for up to date information about our syllabus, any changes to the schedule, and for additional handouts or reading material.

Instructor Office Hours

My office hours are scheduled on **Wednesdays 1:30 – 4:30 pm** or by appointment. However as a faculty interested in the development of undergraduate education and access, I follow an *open door* policy. This means that you are welcome to visit my office anytime when I am in my office. Preferably, you could email me before stopping by to make sure that I am in my office.

Teaching Assistants

Kyle Kroeger

Email: kroegerk@wharton.upenn.edu

Claire Frankel

Email: frankelc@seas.upenn.edu

Office Hours: TBD, Venue: 606 JMHH

We will schedule some recitations/help sessions with the TAs (also review sessions before exams). The timing, location and duration of these help sessions will be decided based on the consensus that emerges from class discussions to ensure that schedule works out best.

Learning Environment– Concert Rules:

In addition to regular class presence, attentive participation and informed discussions are critical to the learning process; they make classes more interesting and enjoyable for all the students. Students are encouraged to volunteer substantive comments and questions freely. On my part, I shall enable a friendly classroom atmosphere that permeates and promotes good

discussion. I consider the quality of comments made by students to be an important factor in enhancing classroom experience.

Classes will start and end on time. Regular attendance is expected. Please try to sit in the same seat for each class and please display your name tents. Late entry or reentry to a class session is allowed only under exceptional circumstances. All phones, laptops and other electronic devices should be turned off.

I encourage you to take advantage of the regular office hours listed above. If they don't fit your schedule, please make an appointment. E-mail is another good way to have your questions answered. It is vital that you communicate with me early on about any difficulties or concerns. In addition to regular office hours, we may also offer some review sessions if there is sufficient student interest. Logistics for these will be discussed in class.

3. Course Grading Policy:

Each student's final numerical score for the course is based on the following components (with % weights): 3 Assignments (18%), 1 In-class Midterm exam (25%), 3 Group Case reports (18%), a Final Exam (25%) and Class Participation (14%). A student's grade is based on the ranking of the student's overall numerical score in the course. The grades are in general relative, although there are minimal absolute standards for passing the course. Therefore, minimal performance requirements apply. Please refer to the Wharton undergraduate handbook for code of conduct and guidelines.

All assignments are to be submitted on paper at the beginning of the class session in which they are due. Do not sign with your (or your group's) names, but sign with your Penn ID numbers.

Individual Problem Sets (Assignments 18%)

The problem sets will consist of problems that support understanding of both the basic and advanced concepts taught in the class. They also prepare you for the midterm and final exam. Assignments will be posted on the canvas website; for a schedule of due dates, please see the course outline below. While group discussions of course material, including assignments, are encouraged, the work you submit must be your own. Each student is required to submit an individual copy of the written assignment at the beginning of class on the given due date. Please, make sure assignments are either typed or clearly written. Put your Penn ID number on the front; no names please. I will post practice problems as well as solutions to all assignments. Should you have any conceptual questions, please contact me during office hours or by e-mail. Late submissions will not be accepted unless you have prior permission from the instructor.

There will 3 assignments adding up to 18% of the course grade.

1. Forecasting and EOQ
2. Queueing, Quality Control and Lean/JIT

3. Newsvendor and Variants

In-Class and Final Exams (50%)

There will be 1 in-class, closed book exam during the semester and a final exam; please mark the dates in your calendar **March 3 (class #15) and May 3**. These exams will be based on concepts covered in class and problems in the homework assignments. If you cannot attend class on the scheduled exam dates do not sign up for this course. Some guidelines and sample questions will be offered during the course.

Group Case Reports (18%)

During the course, we will discuss interesting cases in class, drawn from different industries such as a hospital setting, car manufacturing, the food industry, the high tech sector, the music industry and the clothing retail industry. Cases are considered an integral part of the course. You are expected to *prepare for each case* by reading the case carefully and by answering a list of guiding questions posted in the case (see Canvas web site). This will enable us to have a productive and meaningful classroom discussion; it will also give you an opportunity to earn scores for your participation grade. Three of these cases are marked with a due date on the course outline below. You are expected to submit a case write-up for these three cases. For the case write-ups, please form *groups of 3 students* and submit one report per group. Indicate the group members by PENN ID on the cover of the report. If a particular group member has not been able to participate in the write-up, please do not include him/her on the cover. The report should clearly state the key problems, provide your analysis, and summarize any takeaways. Reports are to be typed (3 pages, double spaced) and are due *at the beginning of the class* in which the case is discussed. Please, submit your case write-ups electronically via Canvas.

The cases that we will be discussing are:

1. *Paediatric Hospital*
2. *Toyota* no submitted paper
3. *Sport Obermeyer*
4. *Hewlett Packard* no submitted paper
5. *Barilla* no submitted paper
6. *Cisco* no submitted paper
7. *Taylor Guitar*

Class Participation (14%)

Attentive participation and informed discussions are critical to the learning process; they make classes more interesting and enjoyable for all the students. Please come prepared to class, to participate, and to volunteer substantive comments freely. On my part, I shall enable a friendly classroom atmosphere that permeates and promotes good discussions. I will include interactive activities in class as well as opportunities to add to class discussions online. From time to time, I

will post articles from magazines and journals on Canvas and discuss them in class (after due notification through email). You are encouraged to send interesting articles to me. I shall post them on Canvas and we may discuss them in class, thus recognizing your effort. This will help us discuss and keep abreast of current innovative ideas in operations management. I consider the quality of comments made by students to be an important factor in enhancing the classroom experience. I expect students to pay attention to other participants and to respect different points of view. While attendance is not mandatory, it should be clear that missing classes cannot add anything positive to your participation score, and may have a negative impact.

Academic Integrity

Students are expected to follow Wharton's guidelines on academic integrity. In particular, you are to submit your own work for assignments and cases. Consulting case discussions from other semesters/classes or using assignment solutions from other sources is considered academic dishonesty and is prohibited.

Course Outline

Status: January 11, 2016. Always check website and lecture slides for updates!

Session #	Date	Topic	Assignment/Case Due
1	Thu 1/14	Introduction	
2	Tue 1/19	Forecasting – Stationary Series	
3	Thu 1/21	Forecasting – Trend and Seasonality	
4	Tue 1/26	Data Analysis / Analytics Bring computer to class.	
5	Thu 1/28	Inventory Control - EOQ Model	
6	Tue 2/2	Inventory Control – Variations of EOQ Model	
7	Thu 2/4	Process Flows – Introduction to Queueing	Assignment 1 Forecasting/EOQ
8	Tue 2/9	Queueing Theory	
9	Thu 2/11	<i>Case: Paediatric Hospital</i>	<i>Case Write-up: Paediatric Hospital</i>
10	Tue 2/16	Variability and Queueing	
11	Thu 2/18	JIT Manufacturing – <i>Case: Toyota</i>	
12	Tue 2/23	Lean Systems, Quality Control	
13	Thu 2/25	Statistical Quality Control	Assignment 2 Queueing/Lean/JIT
14	Tue 3/1	Quality Management	
15	Thu 3/3	In-Class Mid-Term #1 [Mark your Calendars]	
---	3/8 & 3/10	Spring Break	
16	Tue 3/15	Newsvendor Model	
17	Thu 3/17	Newsvendor Model: Assemble / Make to Order	
18	Tue 3/22	Quick Response with Reactive Capacity	
19	Thu 3/24	<i>Case: Sport Obermeyer</i>	<i>Case Write-up: Sport Obermeyer</i>
20	Tue 3/29	Lead Times: The Order Up-to Model	
21	Thu 3/31	Postponement <i>Case: Hewlett Packard</i> Bring computer to class.	
22	Tue 4/5	<i>Root Beer Game</i> Meet in computer lab.	Assignment 3 Newsvendor
23	Thu 4/7	Supply Chain Coordination, <i>Case: Barilla</i>	
24	Tue 4/12	Managing Risk in Operations – Risk Pooling <i>Costco, Amazon Fufillment</i>	
25	Thu 4/14	Supply Chain Risk Management, <i>Case: Cisco</i>	
26	Tue 4/19	Revenue Management - Theory	
27	Thu 4/21	Revenue Management – Problem Solving Bring computer to class.	
28	Tue 4/26	Supply Chain and Sustainability <i>Case: Taylor Guitars</i>	<i>Case Write-up: Taylor Guitars</i>
Final Exam	Tue 5/3, noon - 2 pm	Final Exam [Mark your Calendars]	