

The Wharton School, University of Pennsylvania  
**OIDD 220-002 Introduction to Operations Management**

Spring Semester 2017

**Syllabus**

Status: November 29, 2016. Please check for updates on website.

**Class Meetings:** Tuesday and Thursday 1:30-2:50 p.m.  
JMHH F70

**Instructor:** **Professor Morris A. Cohen**  
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**Office hours:** Wednesday 3:00-5:00 pm and by appointment

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

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Office Hours: TBA

Venue: TBA

## 1. Course Description

This course introduces quantitative and qualitative concepts and tools of operations management that will improve the performance of an organization or enhance a firm's competitive advantage. The operations function in a firm/organization is responsible for those activities that lead to the production of outputs (products) that are made available to users (customers) in order to generate value. Thus, in operations management, we examine the planning and execution of delivering products and services. In this course, we will study 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 and aerospace industry, fashion retailers, health care services, semiconductor and high tech industries, among others. These examples will illustrate how companies use operations management principles in order to gain competitive advantage.

This course is highly recommended for students

- majoring in operations management;
- interested in consulting jobs in various industries;
- majoring in engineering or science disciplines with an interest in understanding the operational issues involved in designing or producing new products and services;
- majoring in other fields and being curious about perspectives of operations management in areas such as marketing, accounting, health care, sports industries or financial services;
- interested in entrepreneurship and start-ups;
- interested in the application of business analytics tools to solve management problems.

Topics covered include forecasting techniques, inventory control under deterministic and uncertain demand, queueing systems and the impact of variability, lean systems, quality control, newsvendor models, risk pooling and supply chain risk management strategies, capacity and revenue management, supply chain coordination, and global supply chain sourcing. The course builds on analytical models and presents a significant number of business cases and applications. The cases, assigned readings and other material provide a supportive structure for the application of the theory developed in the course.

OIDD 220 is an introductory course for students interested in operations management. This course may be followed by other operations courses such as Service Operations Management, Retail Supply Chain Management, Management Science, Scaling Operations in Technology Ventures, Computer Simulation Models, or other elective courses in OIDD.

## 2. Course Logistics

### Prerequisites

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

### Course Website

We will be using a Canvas based website <https://canvas.upenn.edu/courses/xxxxxxx>. If you have difficulty accessing the course website, please let me know as soon as possible. Canvas is the portal for all class communications. In particular, I will post all lecture notes, slides, and assignments on Canvas. 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.

### 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 chapters from Cachon and Terwiesch are available as a custom made textbook at the PENN Bookstore: Cohen/Rieders, *Introduction to Operations Management – OIDD 220*, 2016.
- The book chapters from the Nahmias text, the cases, and other materials are available through Study.Net which is linked to the course Canvas site.
- Additional reading material (articles, assignments, and lecture notes) will be posted on the course's website.
- Students are required to participate in the Root Beer Game simulation in Session 22. Instructions for purchasing access to this software from Harvard Business Publishing will be posted on Canvas.

### Learning Environment

Our class sessions will be a mix of traditional lectures, class discussions and learning activities that involve all students, either individually or in teams. It is imperative that students come prepared to class and are fully engaged in our class meeting. During discussions and/or group work, I expect students to pay attention to other participants and to respect different points of view.

The instructor welcomes your questions during class and outside the classroom. I encourage you to take advantage of the regular office hours listed above. If they don't fit your schedule, please make an appointment. I will make every effort to be available. 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 by the instructor and the TAs, we may also offer some review sessions if there is sufficient student interest. Logistics for these will be discussed in class.

Wharton concert rules apply: Classes will start and end on time. Regular attendance is expected. Please, sit according to the seating chart and display a typed, readable name tent in all classes. Late entry or reentry to a class session is allowed only under exceptional circumstances. All phones, laptops and other electronic devices should only be used during class if you are requested to use them. We will announce the need to bring computers to class.

### 3. Grading Policy

Your grade in this course will be based on individual and group evaluations according to the following rubric:

Class Participation	individual	16%
Assignments (5)	individual	18%
Case Write-Ups (3)	group	16%
Midterm 1: <b>Thursday, March 2, in class</b>	individual	25%
Final Exam: <b>Tuesday May 2, 12-2 pm, room TBA</b>	individual	25%

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, however with minimal absolute standards for passing the course. Please refer to the Wharton undergraduate handbook for code of conduct and guidelines.

#### **Class Participation**

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 come prepared to class, to participate, and to volunteer substantive comments freely. Preparation for class may include assigned readings before class, some problem solving or special preparation work for computer based sessions. Please, refer to the Canvas site on up to date information on required prep work. 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. Some of these activities may be labelled as quizzes and will contribute to your participation grade. Occasionally, I will post articles from magazines and journals on Canvas and discuss them in class (after due notification through email). Students are encouraged to send interesting articles to me. I shall post them on Canvas and may discuss them in class, thus

recognizing the student's 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. 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. Please, communicate with me on special circumstances regarding attendance. Your participation score will be based on in class participation, case discussions, your level of preparation for class meetings, and your voice in online discussions.

### **Assignments**

The problem sets will ensure that you have ample opportunity to apply the concepts learned in class and will increase your understanding of the material. 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. Teaching assistants will also be available to clarify concepts. Late submissions will not be accepted unless you have prior permission from the instructor.

There will 5 assignments adding up to 18% of the course grade.

1. Forecasting and EOQ
2. Queueing
3. Quality Control and Lean/JIT
4. Newsvendor and Variants
5. Risk Pooling and Revenue Management

### **Group Case Write-Ups**

During the course, we will discuss interesting cases in class, drawn from different industries such as a hospital setting, automobile and aerospace industries, the food industry, the high tech sector, 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 for each 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 in 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 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. Analytical work is to be presented in a concise form; details may be added in an appendix. Reports are to be typed (3 pages,

double spaced, appendix not to exceed 2 pages) and are due *at the beginning of the class* in which the case is discussed.

The cases that we will be discussing are listed here. \* indicates that the case is to be submitted as a written report. Case write-ups will make up 16% of your grade; in class case discussions will substantially contribute to your 16% participation grade.

1. Paediatric Hospital \*
2. Toyota
3. Sport Obermeyer \*
4. Hewlett Packard (in-class computer based analysis)
5. Barilla
6. Boeing \*
7. Cisco

### **Exams**

There will be two closed book exams: One midterm exam on **Thursday, March 2, during class** and a final exam on **Tuesday May 2, 12-2 pm**. Please, mark the dates in your calendars. If you cannot attend class on the scheduled exam dates do not sign up for this course. Important formulae will be provided as part of the exam. Some guidelines and sample questions will be offered during the course.

### **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: November 29, 2016. Always check website and lecture slides for updates!

Session #	Date 2017	Topic	Assignment/ Case due in class	Preparation for this session. For additional info, see Canvas
1	Thu 1/12	Introduction		
2	Tue 1/17	Forecasting – Stationary Series		
3	Thu 1/19	Forecasting – Trend and Seasonality		
4	Tue 1/24	Data Analysis / Analytics <b>Bring computer to class.</b>		Prepare excel files; bring prep work to class
5	Thu 1/26	Inventory Control – EOQ Model		
6	Tue 1/31	Inventory Control – Variations of EOQ Model		
7	Thu 2/2	Process Flows – Introduction to Queueing	<i>Assignment 1 Forecasting/EOQ</i>	
8	Tue 2/7	Queueing Theory		
9	Thu 2/9	<i>Case: Paediatric Hospital</i>	<i>Case Write-up: Paediatric Hospital</i>	
10	Tue 2/14	Variability and Queueing		
11	Thu 2/16	JIT Manufacturing – <i>Case: Toyota</i>	<i>Assignment 2 Queueing</i>	Prepare case Toyota
12	Tue 2/21	Guest speaker: Jamie Bonini, Vice President TSSC at Toyota Engineering and Manufacturing North America		Readings posted on Canvas
13	Thu 2/23	Statistical Quality Control <b>Bring computer to class.</b>		
14	Tue 2/28	Quality Management	<i>Assignment 3 Lean/Quality</i>	
15	<b>Thu 3/2</b>	<b>In-Class Mid-Term #1 [Mark your Calendars]</b>		
---	3/7 & 3/9	<b>Spring Break</b>		
16	Tue 3/14	Newsvendor Model		
17	Thu 3/16	Newsvendor Model: Assemble / Make to Order		
18	Tue 3/21	Quick Response with Reactive Capacity		
19	Thu 3/23	<i>Case: Sport Obermeyer</i>	<i>Case Write-up: Sport Obermeyer</i>	
20	Tue 3/28	Lead Times: The Order Up-to Model		
21	Thu 3/30	Postponement <i>Case: Hewlett Packard</i> <b>Bring computer to class.</b>		Do prep work on HP case in Excel; bring to class

Session #	Date 2017	Topic	Assignment/ Case due in class	Preparation for this session. For additional info, see Canvas
22	Tue 4/4	<i>Root Beer Game</i> <i>Meet in computer lab.</i>	<i>Assignment 4</i> <i>News vendor</i>	
23	Thu 4/6	Supply Chain Coordination, <i>Case: Barilla</i>		Prepare case Barilla
24	Tue 4/11	Supply Chain Coordination, <i>Case: Boeing – The Fight for Fasteners</i>	<i>Case Write-up: Boeing</i>	
25	Thu 4/13	Managing Risk in Operations – Risk Pooling <i>Costco, Amazon Fulfillment</i>		
26	Tue 4/18	Revenue Management - Theory		
27	Thu 4/20	Revenue Management – Problem Solving		
28	Tue 4/25	Supply Chain Risk Management, <i>Case: Cisco</i>	<i>Assignment 5</i> <i>Risk Pooling/Revenue Management</i>	Prepare case Cisco
	<b>Tue 5/2 noon - 2 pm</b>	<b>Final Exam [Mark your Calendars]</b>		