

The Wharton School, University of Pennsylvania
OIDD 220-001 Introduction to Operations Management

Spring Semester 2020

Syllabus

Status: January 7, 2020. Please check for updates on website.

Class Meetings: Tuesday and Thursday 3:00-4:20 p.m.
JMHH G55

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

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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 various industries including the automobile and aerospace sectors, fashion retailers, health care services, food providers, and high tech industries. 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, queueing systems and the impact of variability, lean systems, quality control, inventory control under deterministic and uncertain demand, newsvendor models, supply chain management, risk pooling and risk management strategies, and capacity and revenue management. The course builds on analytical models, discusses a significant number of business cases and applications and includes data analytics in in-class and at home assignments. The cases, assigned readings and other material provide a supportive structure for the application of the theory developed in the course.

OIDD 220 constitutes an introduction to operations management. This course may be followed by 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 materials. Make sure you have set up your Canvas account so that you receive notifications about any new postings.

Course Text and Materials

- Course material will be mostly drawn from two books: *Production and Operations Analysis* by Nahmias and Olsen and *Matching Supply with Demand: An Introduction to Operations Management* by Cachon and Terwiesch. Both books are on reserve at the Lippincott Library.
- Relevant chapters from the Cachon and Terwiesch book are available as a custom made textbook at the PENN Bookstore: Cohen/Rieders, *Introduction to Operations Management – OIDD 220*, 2016. Purchase of this custom book is highly recommended; reading assignments and sample problems will refer to this text.
- The book chapters from the Nahmias and Olsen text and the cases 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 Canvas.
- Students are required to participate in an online simulation. Instructions for purchasing and for access to this software will be posted on Canvas. Costs are \$15.

Learning Environment

Our class sessions will be a mix of traditional lectures, class discussions and experiential 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 the course, we will discuss interesting cases in class, drawn from different industries such as a hospital setting, automobile industry, the computer and high tech sector, the clothing retail industry and the sports 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. During discussions and/or group work, I expect students to pay attention to other participants and to respect different points of view.

I welcome your questions during class and outside the classroom and 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. I 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	12%
Individual Assignments	individual	17%
Group Write-Ups	group	16%
Midterm 1: Thursday, March 5th, in class	individual	25%
Final Exam: TBA	individual	30%

A student's grade is based on the ranking of the student's overall numerical score in the course.

Class Participation (12%)

Attentive participation and informed discussions are critical to the learning process; they make classes more interesting and enjoyable for all the students. Students are expected to come prepared to class, to participate, to ask questions, 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, and some submissions to Canvas prior to class. Please, refer to the Canvas site on up to date information and expectations for

each session. Your participation grade will be based on

- my evaluation of your consistent engagement and the quality of your contributions, questions and answers in our discussions;
- and points given for
 - your level of active preparation for class (as demonstrated by completing assigned prep work);
 - your understanding of previously introduced basic concepts (your score in brief in-class quizzes);
 - your engagement with the experiential learning opportunities (simulation, electronic assembly exercise);
 - the quality of your participation in online discussions.

The point based evaluation will use a benchmark that allows you to miss 2 to 3 opportunities during the semester without penalty.

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. 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 may post them on Canvas and 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. 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 about special circumstances regarding attendance.

Individual Assignments (17%)

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 for clarifying concepts. Late submissions will not be accepted unless you have prior permission from the instructor.

There will 5 assignments; note that the length and points for each assignment may vary.

1. Forecasting
2. Queuing
3. EOQ
4. Newsvendor
5. Risk Pooling/Revenue Management

Group Write-Ups (16%)

There are four assignments will require you to work in teams and to submit one report for the whole group. Please form *groups of 4 students* by signing up on Canvas. For any group assignment, 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.

1. Paediatric Hospital
2. Process Improvement
3. Sports Obermeyer
4. Sustainability Case

Guiding questions and guidelines for format, length, and content will be posted for each assignment.

Exams (55%)

There will be two closed book exams: One midterm exam (worth 25%) on **Thursday, March 5th, during class** and a final exam (worth 30%) on **date TBA**. Please, mark the dates in your calendars. If you cannot attend class on the scheduled exam dates, do not sign up for this course. A list of important formulae will be provided for the exam. Some guidelines and sample questions will be posted on Canvas.

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.

OIDD 220 - Spring 2020 – Tentative Course Outline

Session #	Date 2020	Topic	Assignment/ Case Due	Preparation for this session; Additional info on Canvas
Introduction				
1	Thu 1/16	Introduction		
Forecasting				
2	Tue 1/21	Forecasting – Stationary Series		
3	Thu 1/23	Forecasting – Trend and Seasonality		
4	Tue 1/28	Data Analysis / Analytics <i>Bring computer to class.</i>		Prepare excel files; bring prep work to class
Managing Queues				
5	Thu 1/30	Process Flows; Little’s Law; Arrival Processes	Assignment 1 Forecasting	
6	Tue 2/4	Basic Queueing Models		
7	Thu 2/6	Variability and Queueing		
8	Tue 2/11	Analyzing Real World Queues <i>Case: Paediatric Hospital</i>	Group Write-up: Paediatric Hospital	
9	Thu 2/13	Queueing – Problem solving <i>Case: REI (part 1)</i> <i>Bring computer to class.</i>		Read case <i>REI</i>
Lean Operations				
10	Tue 2/18	Electronic Assembly Exercise	Assignment 2 Queueing	
11	Thu 2/20	JIT Manufacturing <i>Case: Toyota</i>		Prepare case <i>Toyota</i>
12	Tue 2/25	Lean Systems		
Managing Quality				
13	Thu 2/27	Statistical Quality Control <i>Bring computer to class.</i>		
14	Tue 3/3	Quality Management	Group Write-up Process Improvement	
15	Thu 3/5	Midterm Exam		
---	3/10 & 3/12	Spring Break		
Inventory Control – Deterministic Demand				
16	Tue 3/17	Inventory Control – EOQ Model		
17	Thu 3/19	Inventory Control – Variations of the EOQ Model		

Newsvendor Models				
18	Tue 3/24	Newsvendor Model <i>REI (part 2)</i>	Assignment 3 EOQ	
19	Thu 3/26	Quick Response with Reactive Capacity		
20	Tue 3/31	<i>Case: Sport Obermeyer</i>	Group Write-up: Sport Obermeyer	
21	Thu 4/2	Lead Times: The Order Up-to Model		
22	Tue 4/7	Postponement <i>Case: Hewlett Packard</i> Bring computer to class.		Read case <i>HP</i> ; do prep work in Excel
Supply Chain Management				
23	Thu 4/9	<i>Simulation: The Root Beer Game</i> Meet in Computer Lab.	Assignment 4 Newsvendor	
24	Tue 4/14	Supply Chain Coordination		
25	Thu 4/16	Supply Chain Risk Management Risk Pooling		
26	Tue 4/21	Sustainability and Operations Management	Group Write-up: Sustainability Case	Read sustainability case
Revenue Management				
27	Thu 4/23	Revenue Management – Theory		
28	Tue 4/28	Revenue Management – Problem Solving		
	Thu 4/30		Assignment 5 Risk Pooling, RM	
	TBA	Final Exam		