

The Wharton School, University of Pennsylvania
OIDD 220 Introduction to Operations Management
Business Analytics and Operations Strategy

Syllabus for Spring 2022

Status: January 11, 2022

Class Meetings: Tuesday and Thursday 3:30-5:00 p.m. JMHH 265
until 1/20, classes will meet on zoom

Instructor: **Professor Maria T. Rieders**
Operations, Information and Decisions Department
The Wharton School
University of Pennsylvania
517 Jon M. Huntsman Hall
(215) 898-0535
rieders@wharton.upenn.edu

Office hours: Tuesdays 10:15-11:45 am and by appointment;
and always by email

Website: Canvas: <https://canvas.upenn.edu/courses/1638574>

Teaching Assistant: Matthew Farrow mfarrow@wharton.upenn.edu

1. Course Description

Operations management is responsible for a firm's planning and execution of delivering products and services to customers. This course focuses on designing, managing, and improving recurring business processes so as to achieve competitive advantage for the firm with respect to quality, responsiveness, price, and variety of products and services.

We will study and apply business analytics tools for forecasting, capacity assessments and service metrics, inventory and supply chain management, statistical quality control, revenue management and risk mitigation in the face of uncertainty. These methods will be explored in the context of various industries such as high tech, healthcare, fashion, automobile, sports, and others. Quantitative analyses of case studies will be complemented by addressing the underlying strategic questions, identifying operational levers to improving a firm's competitive success in the market place.

This course is highly recommended for students

- interested in a management position in operations;
- planning to work in business analytics;
- interested in consulting jobs in various industries;
- in engineering or science disciplines with an interest in understanding the operational issues involved in designing or producing new products and services;
- in non-technical fields who want to explore perspectives of operations management in areas such as marketing, accounting, health care, sports industries or financial services;
- interested in entrepreneurship and start-ups.

This course counts towards a general concentration in OIDD, serves as a foundation course for the Operations Management/Management Science Track, and counts towards the joint concentration in Marketing and Operations Management as well as the Business Analytics concentration.

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 highly desirable but not required; any necessary background will be introduced in class. Students are encouraged to communicate with the instructor if they perceive significant gaps.

Course Website

We will be using a Canvas based website <https://canvas.upenn.edu/courses/1638574>. 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

All materials will be available on Canvas through the tabs for Study.Net and Course Materials @ Penn Libraries.

- A **Study.Net** reading pack contains all cases covered in this course
- A second **Study.Net** pack will contain access to the Littlefield simulation gam
- **Course Materials @ Penn Libraries** provides relevant chapters from two textbooks:
 - *Production and Operations Analysis* by Nahmias and Olsen
 - *Matching Supply with Demand: An Introduction to Operations Management* by Cachon and Terwiesch
- Additional reading material (articles, lecture notes, etc.) will be posted on Canvas.

Learning Environment

The structure of this class is based on the premise that students learn in a variety of ways, and that topics should be explored through different approaches. Thus, during each class period, we may use elements of lectures, interactive games and simulations, hands-on workshops, group work, case discussions, or guided problem solving. In between classes, you may be asked to prepare for class by focused reading, watching a brief video, participating in an online discussion, or performing some data analytic prep work for class. I will strive to balance the work load, and may occasionally spend less time in class if there was substantial prep time required before class. In return, I expect that students will come prepared for class – for their own learning benefit as well as for the benefit of the class community so that we can all work with the same assumptions. The diverse and interactive nature of our classroom activities demands each student to be engaged and willing to participate. While attendance is not a strict requirement, your lack of attendance will not allow you to fully participate and may hurt your participation grade. In particular, if you experience any extended absence, please communicate as early as possible with your instructor. Last, but not least, I want to remind everybody to accept different viewpoints and to treat all participants with respect. For my part, I will try to create an open minded and friendly classroom atmosphere.

Your success in the course will depend on your level of engagement and attention to upcoming assignments and activities. You are responsible to follow the timeline of readings, assignments, and activities as posted on Canvas. To facilitate things, I posted an outline on our home page with due dates. In addition, every weekend I will post a detailed preview of your responsibilities for the upcoming week.

We will start the semester once again with a few online classes. For any interactions via zoom, I'd like to state some expectations around best online practices. Classes will start and end on time – prepare your setup accordingly. If at all feasible, turn on your camera, especially during interactive sessions or during group work. We all become better communicators when we see our colleagues! Microphones should be muted unless you

want to speak or are in a small breakout group. Technical problems do happen at times; you may then have to turn off your video to save bandwidth or you may have to reconnect if your connection got dropped.

I welcome your questions during class and outside the classroom and encourage you to take advantage of the regular office hours listed above. E-mail is another good way to have your questions answered or to set up a one-on-one meeting. It is vital that you communicate with me early on about any difficulties or concerns. In addition, I may also offer some review sessions if there is sufficient student interest. Logistics for these will be discussed in 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	15%
Individual Assignments	individual	20%
Group Write-Ups	group	25%
Midterm: Thursday, March 3rd, 3:30-5:00 pm	individual	20%
Final Exam: date TBA	individual	20%

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

Class Participation (15%)

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 includes assigned readings, some problem solving or special preparation work, and some submissions to Canvas prior to class. It may also include taking a brief quiz before class or participating in online discussions. Please, refer to the Canvas site for up to date information and expectations for each session. Your participation grade will be based on

- my qualitative evaluation of your consistent engagement and the quality of your contributions, questions and answers in our discussions in and out of the classroom (i.e., during sessions and online)
- and quantitative assessments via points given for
 - your level of active preparation for class (as demonstrated by completing assigned prep work);

- your understanding of basic concepts from a prior class or from an assigned reading (e.g., your score in brief quizzes);
- your engagement with the experiential learning opportunities (simulations and in-class activities);

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

Individual Assignments (20%)

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 about one week prior to the due date; 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. Please, make sure assignments are either typed or clearly written. Late submissions will not be accepted unless you have prior permission from the instructor. There will 4 assignments; note that the length and number of points for each assignment may vary.

1. Forecasting
2. Queueing
3. EOQ
4. Newsvendor

Group Write-Ups (25%)

There are four assignments that will require you to work in teams and to submit one write-up 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. Guiding questions and guidelines for format, length, and content will be posted for each assignment.

1. Paediatric Hospital
2. Littlefield Capacity
3. Sports Obermeyer
4. Littlefield Inventory

Exams (40%)

There will be two exams: One midterm exam (worth 20%) on **Thursday, March 3rd, during class** and a final exam (worth 20%) on **date TBA**. Please, mark the dates in your calendars. Exams will be a mix of multiple choice, short essay, and quantitative questions. Exam 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 2022 - Tentative Outline

Check on Canvas for up-to-date information

Session #	Date 2022	Topic	Assignment/ Group Write-ups Due	Preparation More TBA on Canvas
Introduction				
1	Thu 1/13	Introduction		
Forecasting				
2	Tue 1/18	Forecasting – Stationary Series		
3	Thu 1/20	Forecasting – Trend and Seasonality		
4	Tue 1/25	Data Analysis / Analytics		
Managing Queues				
5	Thu 1/27	Processes: Flow Charts, Metrics; Little's Law	Assignment 1 Forecasting	
6	Tue 2/1	Arrival and Service Time Characteristics Basic Queueing Models		
7	Thu 2/3	Variability and Queueing		
8	Tue 2/8	Guidance Littlefield Simulation 4:00 pm Start Littlefield Capacity Simulation - Start		Explore Littlefield software
9	Thu 2/10	Case Paediatric Hospital The Psychology of Waiting	Group Write-up 1: Paediatric Hospital	
10	Tue 2/15	4:00 pm Littlefield Capacity Simulation – End Problem Solving		
Lean Operations				
11	Thu 2/17	JIT Manufacturing Case: Toyota Operations at Tesla	Assignment 2 Queueing	Prepare case Toyota
12	Tue 2/22	Electronic Assembly	Group Write-up 2: Littlefield Capacity	

Managing Quality				
13	Thu 2/24	Statistical Quality Control Workshop		
14	Tue 3/1	Six Sigma, Quality Management		
15	Thu 3/3	Midterm Exam		
		Break 😊		
Inventory Control – Deterministic Demand				
16	Tue 3/15	Inventory Control – EOQ Model		
17	Thu 3/17	Inventory Control – Variations of the EOQ Model		
Newsvendor Models				
18	Tue 3/22	Newsvendor Model	Assignment 3 EOQ	
19	Thu 3/24	Quick Response with Reactive Capacity		
20	Tue 3/29	Case: Sport Obermeyer	Group Write-up 3: Sport Obermeyer	Prepare case Sport Obermeyer
21	Thu 3/31	Lead Times: The Order Up-to Model		
22	Tu 4/5	Case: Hewlett Packard		Read case <i>HP</i> ; do prep work in Excel
23	Thu 4/7	Guidance Littlefield Simulation 4:00 pm Littlefield Inventory Simulation - Start	Assignment 4 Newsvendor	
Revenue Management				
24	Tue 4/12	Revenue Management		
Supply Chain Management				
25	Thu 4/14	4:00 Littlefield Inventory Simulation – End Debrief Littlefield Inventory Simulation – Industry Speaker		
26	Tue 4/19	Supply Chain Management Case: <i>Zara</i>		Prepare Case <i>Zara</i>
27	Thu 4/21	Supply Chain Coordination and Risk Management	Group Write-up 4: Littlefield Inventory	
28	Tue 4/26	Review		
	TBA	Final Exam		