

The Wharton School, University of Pennsylvania  
**OIDD 2200 Introduction to Operations Management**  
**Business Analytics and Operations Strategy**

**Syllabus for Spring 2023**

Status: December 20, 2022

Work in Progress. Some features and/or dates may change. Check for updates.

- Class Meetings:** Tuesday and Thursday 1:45-3:15 p.m.  
Room TBA
- 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](mailto:rieders@wharton.upenn.edu)
- Office hours:** TBA  
and always by email
- Website:** Canvas:
- Teaching Assistant:** Arush Mehrotra [arushm@upenn.edu](mailto:arushm@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 in Business Analytics.

OIDD 2200 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; some 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 xxxx. 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 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 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. 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, you will find 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.

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: <b>Thursday, March 2nd, in class</b> | individual | 20% |
| Final Exam: <b>date TBA</b>                   | 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, taking a brief quiz 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 equal parts of

- 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);
- a quantitative assessment via points given for assigned activities; this 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 Canvas 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 Work (25%)**

There are four assignments that will require you to work in teams:

1. Paediatric Hospital – Case Write-up (analyzing and improving patient flow at a health care facility)
2. Littlefield Capacity – One Week Team Simulation plus Report (managing instrument capacity at a laboratory in the face of uncertain demand)
3. Littlefield Inventory – One Week Team Simulation plus Report (managing a laboratory with response time sensitive contracts)
4. Sustainability Strategy – Group Project plus Presentation (exploring operational sustainability strategies in a firm of your choice)

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 work, please do not include him/her on the cover. Guiding questions and guidelines for format, length, and content will be posted for each assignment.

### **Exams (40%)**

There will be two exams: One midterm exam (worth 20%) on **Thursday, March 2<sup>nd</sup>, 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; they will be closed book exams but will include a comprehensive formulae sheet. 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 2200 - Spring 2023 - Tentative Outline

Check on Canvas for up-to-date information

| Session #                     | Date 2023 | Topic   | Assignment/<br>Group Write-ups Due          | Preparation<br>More TBA on<br>Canvas |
|-------------------------------|-----------|---|---|--------------------------------------|
| <b>Introduction</b>           |           |   |   |                                      |
| 1                             | Thu 1/12  | Introduction  |   |                                      |
| <b>Forecasting</b>            |           |   |   |                                      |
| 2                             | Tue 1/17  | Forecasting – Stationary Series   |   |                                      |
| 3                             | Thu 1/19  | Forecasting – Trend and Seasonality   |   |                                      |
| 4                             | Tue 1/24  | Forecasting Data Analytics Workshop   |   |                                      |
| <b>Managing Process Flows</b> |           |   |   |                                      |
| 5                             | Thu 1/26  | Processes: Flow Charts, Metrics; Little’s Law   | Assignment 1<br>Forecasting                 |                                      |
| 6                             | Tue 1/31  | Modelling Variability   |   |                                      |
| 7                             | Thu 2/2   | Queueing Workshop   |   |                                      |
| 8                             | Tue 2/7   | Guidance Littlefield Simulation<br><b>2:15 pm Start Littlefield Capacity Simulation - Start</b> |   | Explore<br>Littlefield<br>software   |
| 9                             | Thu 2/9   | Case Paediatric Hospital<br>The Psychology of Waiting   | Group Write-up<br>1: Paediatric<br>Hospital |                                      |
| 10                            | Tue 2/14  | <b>2:15 pm Littlefield Capacity Simulation – End</b><br>Problem Solving                         |   |                                      |
| <b>Lean Operations</b>        |           |   |   |                                      |
| 11                            | Thu 2/16  | JIT Manufacturing<br>Case: Toyota<br>Operations at Tesla  | Assignment 2<br>Queueing                    | Prepare case<br>Toyota               |
| 12                            | Tue 2/21  | Electronic Assembly   | Group Report 2:<br>Littlefield<br>Capacity  |                                      |
| <b>Managing Quality</b>       |           |   |   |                                      |
| 13                            | Thu 2/23  | Statistical Quality Control<br>Workshop   |   |                                      |
| 14                            | Tue 2/28  | Six Sigma, Quality<br>Management  |   |                                      |
| 15                            | Thu 3/2   | <b>Midterm Exam</b>   |   |                                      |

|   |            |  |  |   |
|---|------------|--|--|---|
|   |            | <b>Break ☺</b>   |  |   |
| <b>Inventory Control – Deterministic Demand</b> |            |  |  |   |
| 16  | Tue 3/14   | Inventory Control – EOQ Model  |  |   |
| 17  | Thu 3/16   | Inventory Control/Production Planning Workshop   |  |   |
| <b>Newsvendor Models</b>                        |            |  |  |   |
| 18  | Tue 3/21   | Newsvendor Model   | Assignment 3<br>EOQ                          |   |
| 19  | Thu 3/23   | Quick Response with Reactive Capacity  |  |   |
| 20  | Tue 3/28   | Lead Times: The Order Up-to Model  | Due: Proposal Sustainability                 |   |
| 21  | Thu 3/30   | Inventory Management Workshop; <i>Case Hewlett Packard</i>                                 |  | Read case <i>HP</i> ; do prep work in Excel |
| 22  | Tue 4/4    | Guidance Littlefield Simulation<br><b>2:15 pm Littlefield Inventory Simulation - Start</b> | Assignment 4<br>Newsvendor                   |   |
| <b>Supply Chain Management</b>                  |            |  |  |   |
| 23  | Thu 4/6    | Supply Chain Management<br><i>Case: Zara</i>   |  | Prepare case <i>Zara</i>                    |
| 24  | Tue 4/11   | <b>2:15 pm Littlefield Inventory Simulation – End</b><br>Supply Chain Risk Management      |  |   |
| 25  | Thu 4/13   | Debrief Littlefield Inventory Simulation<br>Industry Speaker                               | <b>Group Report 3: Littlefield Inventory</b> |   |
| <b>Revenue Management</b>                       |            |  |  |   |
| 26  | Tue 4/18   | Revenue Management   |  |   |
| <b>Sustainability</b>                           |            |  |  |   |
| 27  | Thu 4/20   | Sustainability Strategies at Patagonia   |  | Read Case <i>Patagonia</i>                  |
| 28  | Tue 4/25   | Student Presentations  | Group Work 4: Sustainability Presentation    |   |
|   | <b>TBA</b> | <b>Final Exam</b>  |  |   |