

The University of Pennsylvania
The Wharton School
Operations, Information and Decisions Department

OIDD 101: Introduction to Operations and Information Management

Spring 2020 Course Syllabus v2.0

Professors: Sec 001: Santiago Gallino, sgallino@wharton.upenn.edu
Office Hours (JMHH 547): Tuesday 3-4:30, or by appointment

Sec 002: Santiago Gallino, sgallino@wharton.upenn.edu
Office Hours (JMHH 547): Tuesday 3-4:30, or by appointment

Sec 002: Sergei Savin, savin@wharton.upenn.edu
Office Hours (JMHH 570): Tuesday 3-4:30, or by appointment

Canvas: <https://canvas.upenn.edu/courses/1493729>

Lectures: Sec 001, Tuesdays, 10:30am-12:00pm, JMHH G06
Sec 002, Tuesdays, 1:30pm-3:00pm, JMHH G06

Recitations: VNCE 112

Exam 1: Wednesday, March 4, 6:00pm – 8:00pm, Locations TBD. (Makeup on 3/18)
Exam 2: Friday, May 8, 3:00pm – 5:00 pm (Makeup in 9/2020)

PhD TAs: Lou, Bowen, bowenlou@wharton.upenn.edu
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TA/Mentors:

| | |
|----------------|--|
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| William Adams | adamswp@wharton.upenn.edu |
| Janice Utomo | janiceku@wharton.upenn.edu |

Mentoring Sessions:

| | Tuesday | Wednesday | Thursday |
|--------------|-------------------------|-------------------------|---------------------------|
| 3:00 to 4:00 | Noga, Even - (G88) | | |
| 4:00 to 5:00 | Noga, Even - (G88) | Yani, Li - (G88) | |
| 5:00 to 6:00 | Vikrant, Ragula - (F36) | Yani, Li - (G88) | Meghna, Sreenivas - (G90) |
| 6:00 to 7:00 | Vikrant, Ragula - (F36) | Simcha, Stadlan - (G88) | Meghna, Sreenivas - (G90) |
| 7:00 to 8:00 | | Simcha, Stadlan - (G88) | Himavni, Kopuri - (F38) |
| 8:00 to 9:00 | | Sravva, Alla - (G90) | Himavni, Kopuri - (F38) |
| | | Sravva, Alla - (G90) | William, Adams - (F36) |
| | | | William, Adams - (F36) |

TA Sessions: JMHH 606

| ALL TAs Office hours are at JMHH 606 | | | | | |
|--------------------------------------|-------------------|------------|-----------------|-----------------------------|---------------|
| | Monday | Tuesday | Wednesday | Thursday | Friday |
| 9:00 to 10:00 | | | | | |
| 10:00 to 11:00 | Janice, Utomo | | | | Clio, Sun |
| 11:00 to 12:00 | Janice, Utomo | | | | Clio, Sun |
| 12:00 to 1:00 | | | | Czarina, Lokin | |
| 1:00 to 2:00 | Meghna, Sreenivas | | | Czarina, Lokin | Rachel, Levin |
| 2:00 to 3:00 | Meghna, Sreenivas | | | | Rachel, Levin |
| 3:00 to 4:00 | Himanvi, Kopuri | Austen, Li | | Shreya, Subramanian | |
| 4:00 to 5:00 | Himanvi, Kopuri | Austen, Li | | Shreya, Subramanian | |
| 5:00 to 6:00 | Janice, Utomo | Clio, Sun | Michelle, Bahar | Amy, Yang | |
| 6:00 to 7:00 | Janice, Utomo | Clio, Sun | Michelle, Bahar | Amy, Yang - Michael, Landau | |
| 7:00 to 8:00 | | | | Michael, Landau | |

Course Description

In this course, we explore a variety of common quantitative modeling problems that arise frequently in business settings and discuss how they can be formally modeled and solved with a combination of business insight and computer-based tools. The key topics we cover include capacity management, service operations, inventory control, structured decision making, constrained optimization, and simulation. Through this course, you will learn to model complex business situations, and you will master tools to improve business performance. The goal is to provide you a set of foundational skills useful for future coursework at Wharton, as well as providing an overview of problems and techniques that characterize disciplines covered in the Operations, Information and Decisions Department.

The course assumes no specific background beyond basic mathematics skills. Familiarity with the basic operations of Excel is helpful, but not required – we will provide tutorials for the needed Excel skills. Furthermore, no prior experience with programming or statistics is expected.

Incidentally, in case you are wondering, the preferred pronunciation for the OID Department's name is to say each letter rather than to try to say something that might rhyme with "android" or "avoid" or "hemorrhoid". Think the communications giant AT&T, as in "A," "T," "and," "T".

Course Format

The course meets twice per week. The first class session is a lecture designed to introduce concepts. The second class session, which we will refer to as the "recitation," reinforces the concepts introduced in the week's lecture. Recitation sessions are divided roughly into two halves: in the first half we will work through calculations first introduced in the lecture, and in the second half you complete a "recitation exercise" that is graded. To promote learning, you are free to ask questions regarding the exercise while you are working on it.

Electronics:

To encourage learning, the use of electronic devices (e.g., mobile devices, tablets, laptops) during lectures is not allowed unless explicitly directed by the instructor. Electronic devices may be used during the time in which you are working on recitation exercises.

Mentoring:

There are weekly mentoring sessions. During the mentoring session, the mentor (an experienced undergraduate student) will work through several practice problems related to the week's lecture materials. Mentoring sessions are intended to supplement rather than replace attending course sessions. Mentoring is optional. The mentoring problems/slides will be posted on Canvas after all mentoring sessions are completed so that they are available to all students in the course.

Course Materials

Textbook:

There is a Custom Coursebook for this course available at the Penn Bookstore. The book covers the material in the class. As the lectures/slides also cover the course material, the book is not strictly required. However, it is a useful resource to provide additional support, reference reading, and practice problems. The Spring 2020 book is similar to the Spring 2019 and 2018 books, but different than books from earlier years.

Online:

Canvas is a web-based application that houses online materials for enrolled students across Wharton. You can access our course by logging into our Canvas page listed at the front of this syllabus. The course Canvas site will be the definitive source for all assignments and deadlines. You will not have access to Canvas until you officially register for the course.

Lecture Slides:

Lecture slides will be posted on Canvas. To facilitate note taking, we will print hard copies of the lecture slides and bring them to each lecture for distribution.

Software:

In this course we use Excel, and in particular two Excel add-ins: Solver and Crystal Ball. All software required for the course is available through the Wharton computing labs in Huntsman Hall. If you are a non-Wharton student and want to use the software in the computing labs then you will need to create (if you haven't already done so) a "Wharton Class Account" that links to your PennKey account. It takes about 15 minutes for a Wharton Class account to sync with a user's PennKey account. Go to this link for details:

<https://app.wharton.upenn.edu/accounts/class.cfm>

Academic Integrity

Students are expected to adhere to the principles of the University's Code of Academic Integrity.

The following actions is a subsample of some of the ethical violations specific to this course:

- Informing students of the content of a recitation exercise before the student has attended their recitation.
- Completing any portion of a recitation exercise that is not your own.
- Broadcasting or disseminating or discussing in any manner or form solutions to graded content without actual collaboration. Put more simply, if you are sharing solutions with other students who may merely be copying your solutions, then that is an ethical violation. As discussed later, you are allowed to collaborate with other students as long as you are all making a good faith effort to do the work individually. You cannot and should not violate the spirit of this privilege.
- Falsely or inaccurately claiming activity on assignments or recitation exercises or other graded content. You should be aware that Canvas tracks ALL of your on-line activity, including each time you have logged on, each click you have made, each assignment/quiz you have opened, etc. Therefore, do not claim that you logged into an assignment and submitted it before the due date when in fact you did not because it is clear in Canvas that you did not.

Deliverables and Grades

Partial credit is not given on recitation exercises, assignments, or exams. The following weights apply to determine your final score % in the course:

| | |
|------------------------|-----|
| Six graded assignments | .30 |
| Recitation exercises | .10 |
| Exam 1 | .30 |
| Exam 2 | .30 |

We will determine two grades for each student and the student's final grade for the course equals the better of the two. The first grade is based on a curve with the following proportions: 25% A, 20% A-, 15% B+, 15% B, 10% B-, 10% C+, 5% C or lower. After normalizing your final score to 100 points (i.e., 100 is the highest achievable score), your second grade is based on the following thresholds: [0,60) C or lower, [60,65) C+, [65,70) B-, [70-75) B, [75,80) B+, [80,85) A-, [85-95] A, [95-100] A+. We do not round final scores to determine your second grade. (Grades lower than C are based on instructor judgment.)

To illustrate how your final course grade is determined, suppose your final score is 84.7 and your class percentile is 77.5% (i.e., your final score is greater than or equal to the score of 77.5% of the students). In that case your first score would be an A (because the top 25% of students receive an A) and your second grade is an A-, because your final score falls in the range [80,85). Your final course grade is the better of the two, which is an A.

Consider a second example in which your final score is also 84.7 but your class percentile is 56%. Your first grade, based on the curve, is a B+, but your second grade remains A-. Your final grade for the course is then A-.

In sum, your final grade is never worse than what is given by the second grade's thresholds, but it might be better, depending on the outcome of the curve.

Assignments:

You are required to complete six graded assignments during this course. The questions on these assignments are similar in nature to the questions on the exams. To promote learning, you may collaborate and/or consult with other students registered this semester in OIDD 101 on these assignments. In other words, you are not cheating if you discuss your solutions to these assignments with other students in this course. However, each student must submit his or her own assignment.

All assignments are due by 11:30 p.m. of the assigned due date (see the course summary). Late assignments are not accepted for credit (even partial credit). You submit your assignments electronically via Canvas.

Be sure to leave sufficient time advance of when an assignment is due in case you experience technical difficulties (e.g., the power on your laptop dies, Wifi is down, etc.). *In other words, technical difficulties do not excuse you from submitting on time.*

Recitation Exercises:

You must attend the class sessions in which you are registered. If you do not attend your registered section, then you receive zero credit for the recitation exercise.

There are 13 recitations.

Your recitation grade is the average of your top 11 recitation exercises (out of 13).

To be clear, we do not grant more than 2 “free passes,” including if you add the class late (missing recitations because you are not in the class is a reason to use some of your free passes). The only time we make exceptions to the 2 “free passes” rule is when a student experiences a very serious and sustained medical situation that prevents the student from participating in the class for more than two weeks. In such cases, students should have their academic advisor contact us.

Exams:

There are two, non-cumulative examinations. You may use during either exam *one* 8.5”x11” sheet of paper that contains your name and whatever notes you wish to write on either side. You may hand write your notes or have them printed. You may only bring one sheet of paper – it is not acceptable to bring two pieces of paper stapled together even if you write on only the outside of each sheet. During the exam, you may not use any other notes, books, slides, handouts, etc. – your only source of reference material is your one 8.5”x11” sheet of paper.

You may use a calculator (which includes graphing or programmable calculators) during the exam. However, you may not use a computer, smart phone, iPod, or any electronic device that runs Excel or can communicate with another electronic device.

Both exams are common exams – all sections take their exam at the same time.

If you have an exam or regularly scheduled course that conflicts with an OIDD 101 exam, then you should submit a request for an alternative time via a Canvas (non-graded) quiz. You should submit your request no later than two weeks before the exam. In general, you will take the OIDD 101 exam in the two hours after the scheduled time for the exam, and if that is not possible, you will take it during the two hours prior to the scheduled time.

If you cannot attend an exam for any other reason, then you must provide documentation as to why you will not be able to attend (or were not able to attend). In general, excused absences are given only for serious health issues. If you are granted an excused absence from Exam 1, then you will need to make up the exam (shortly after Spring Break), or, if that is not

possible, when Exam 1 is offered in Fall semester. If you are granted an excused absence from Exam 2, then you will take a make-up exam during the university's scheduled make-up exam, which usually occurs in early September.

Support Questions and Assistance

The mentoring sessions provide a regular meeting for the discussion of the weekly course content. In addition to mentoring sessions, there are regular Teaching Assistant (TA) office hours.

Concerns with Grading

If you have a question about your grade, please contact in writing (e.g., an email) the appropriate Professor (i.e., the professor who taught you the material in question). Your entire document will be reviewed. You may submit a request to review your assignment, recitation exercise, or exam only within the two-week period after the assignment/recitation exercise was due or the exam was taken.

Waivers and Prior Experience

Many of you have significant experience with computer technologies. A potentially dangerous strategy is to assume that because you are technologically literate, you know everything you need to know about business modeling and quantitative analysis. While our goal is to make this class as accessible as possible to all students, it is very difficult to do well if you rely only on prior knowledge and/or doing the readings on your own.

As a rule, we do not grant waivers of OIDD 101 except for M&T students and dual degree students who are receiving a degree from Engineering in addition to Wharton.

Schedule Summary

2020 January

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------|--------------------------------------|----------------------------|--------------------|--------------------|----------|--------|
| 30 | 31 | 01 | 02 | 03 | 04 | 05 |
| 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| 13 | 14 | 15 First Day of Classes | 16 Recitation 0 | 17 Recitation 0 | 18 | 19 |
| 20 | 21 Lecture 1: Process Performance | 22 | 23 Recitation 1 | 24 Recitation 1 | 25 | 26 |
| 27 | 28 Lecture 2: Process Improvement | 29 | 30 Recitation 2 | 31 Recitation 2 | 01 | 02 |
| 03 | 04 | Notes: | | | | |

2020 February

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------------------|---|-----------|--------------------|--------------------|----------|--------|
| 27 | 28 | 29 | 30 | 31 | 01 | 02 |
| 03 Assignment 1 | 04 Lecture 3: Multiple Flow Units | 05 | 06 Recitation 3 | 07 Recitation 3 | 08 | 09 |
| 10 | 11 Lecture 4: Process Set up | 12 | 13 Recitation 4 | 14 Recitation 4 | 15 | 16 |
| 17 Assignment 2 | 18 Lecture 5: Queue Dynamics | 19 | 20 Recitation 5 | 21 Recitation 5 | 22 | 23 |
| 24 | 25 Lecture 6: Structured Decision Making | 26 | 27 Recitation 6 | 28 Recitation 6 | 29 | 01 |
| 02 | 03 | Notes: | | | | |

2020 March

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------------------|--|----------------------------|--------------------|--------------------|--------------------|--------------------|
| 24 | 25 | 26 | 27 | 28 | 29 | 01 |
| 02 Assignment 3 | 03 Review Session First Half | 04 First Exam | 05 | 06 | 07 Spring Break | 08 Spring Break |
| 09 Spring Break | 10 Spring Break | 11 Spring Break | 12 Spring Break | 13 Spring Break | 14 Spring Break | 15 Spring Break |
| 16 | 17 Lecture 7: Modeling Business Decisions | 18 First Exam - Make Up | 19 Recitation 7 | 20 Recitation 7 | 21 | 22 |
| 23 | 24 Lecture 8: Linear Modeling | 25 | 26 Recitation 8 | 27 Recitation 8 | 28 | 29 |
| 30 Assignment 4 | 31 Lecture 9: Sensitivity Analysis | Notes: | | | | |

2020 April

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------------------|---|---------------------------|----------------------------------|---------------------|----------|--------|
| 30 | 31 | 01 | 02 Recitation 9 | 03 Recitation 9 | 04 | 05 |
| 06 | 07 Lecture 10: Integer Models | 08 | 09 Recitation 10 | 10 Recitation 10 | 11 | 12 |
| 13 Assignment 5 | 14 Lecture 11: Models Under Uncertainty | 15 | 16 Recitation 11 | 17 Recitation 11 | 18 | 19 |
| 20 | 21 Lecture 12: Simulation | 22 | 23 Recitation 12 | 24 Recitation 12 | 25 | 26 |
| 27 Assignment 6 | 28 Lecture 13: Comparing Decisions with Sim. | 29 Last Day of Classes | 30 Review Session Second Half | 01 | 02 | 03 |
| 04 | 05 | Notes: | | | | |

2020 May

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------|-------------------|-----------|----------|------------------------------|----------|--------|
| 27 | 28 | 29 | 30 | 01 | 02 | 03 |
| 04 | 05 | 06 | 07 | 08 Final Exam 3:00 - 5:00 | 09 | 10 |
| 11 | 12 Exam Period | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 01 | 02 | Notes: | | | | |