

**OPIM 101 – Introduction to Operations and Information Management
Fall 2014 (Revised)**

Section 001: MW 10:30-12

Section 002: MW 12-1:30

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Course Overview

In this course we will 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 will cover include constrained optimization, process modeling and operational analysis, simulation, decision theory, and modeling and analyzing strategic interaction in competitive markets. Along the way, students will become familiar with spreadsheets, optimization solvers, and discrete event simulation tools that can be helpful in solving these problems. The goal is to provide a set of foundational skills useful for future coursework at Wharton as well as providing an overview of problems and techniques fundamental to the disciplines represented by Operations and Information Management.

The course presumes no specific background other than basic mathematics skills. Students will need access to a personal computer (preferably their own) to complete many of the assignments.

Course Format

Regular Lecture/Discussion. Classes will include a mixture of lectures, computer demonstrations, and case discussions. The course is intended to be interactive, so students are expected to come to class prepared to discuss the material. Practice problems will be provided which should be attempted before class. On three occasions I will ask you to submit your solutions to the practice problems. With a few exceptions, you should assume you have something to turn in every Monday and will have 30-60 minutes of readings and preparation for each class.

Problem Solving Sessions. There will be three meetings in the computer labs where students in small groups will complete a short assignment to build mastery of the relevant computational tools. The problems will be provided ahead of time, and solutions will be posted after the session. Submission of the lab problem is required; attendance at the lab session is optional but encouraged. Lab sessions are held during regular class time.

Problem Sets. There will be one required problem set (simulation) and four other problem set opportunities (three of these four are required). These can be challenging and sometimes time consuming, so please plan ahead.

Readings. There is one required textbook:

- Custom CourseBook for OPIM101. The book, available at the Bookstore, is the same as it was in Fall 2013. Earlier versions are similar but not identical. Editions prior to 2011 and course materials for the Spring are not usable at all.

Reading Guides and Work Submission. You are required to visit Canvas before every session for the reading guide which includes a description of the session, readings, exercises, and other materials. All assignments are to be submitted in digital form on Canvas. Time critical announcements will be placed on the front page. I will assume that anything posted on Canvas will be read before the following session.

Handouts. We will generally hand out lecture notes for each session except for select case discussions. These will be billed to your bursar account. Lecture notes will also be available online on Canvas after class. Some additional readings may be distributed as handouts as well.

Using Computers In Class. Computers are always permitted during review sessions and the lab sessions. Otherwise, computers (including tablets and smartphones) are not permitted without instructor permission. Please do not make video or audio recordings of class sessions without instructor permission. I have a zero tolerance policy for use of electronic devices for non-class work during class.

Discussion Forum. We will use Piazza for the class forum. This is an online facility that allows you to ask questions and receive answers from other students and the course staff. All requests for assistance should be posted on Piazza – I have found that this is faster and more effective than e-mail. You may also e-mail the instructor, but that should be for private discussion. Please do not post solved problems on Piazza. I do not monitor any of the messaging facilities on Canvas so please do not use them.

Software. Learning to use computer-based tools is a central theme of the course. The software used in the course will include:

- Microsoft Excel 2013. We are using Excel 2013 for the course. Excel 2010 is acceptable. Previous versions and the Mac version are not recommended. If you do not have Excel you can use the labs, obtain a trial copy from Microsoft, buy it at a reduced student rate at the Computer Connection, or subscribe to Office 365 for a few months (it is ~\$6 per month).
- Goldsim discrete event simulation package (see www.goldsim.com). We will provide everyone with download instructions and a product key for Goldsim. One lab in Huntsman will also have Goldsim installed although this has proven unreliable so we strongly recommend obtaining your own copy. If this causes concern, contact the instructors immediately and we can work out a solution. Please do not install Goldsim on more than one machine. If you do, you may prevent another student from accessing their copy (!).
- (As needed for Mac users) VMWare Fusion/Windows 7. I have arranged for free copies of VMWare Fusion (virtualization software) for all students in the class. A download link will be posted. You will only use this if you have a Mac. Copies of Windows 7 to install in Fusion will be provided by the department.

Note to Mac Users. You cannot complete the course using Mac software. Solver (Excel) works strangely and Goldsim does not have a Mac version at all. You can either 1) Get a cheap PC, 2) Run Windows on your Mac, 3) Borrow a PC from family or a friend. As noted above, we can provide free

copies of Virtualization software (VMWare Fusion) and Windows 7 (Enterprise) so you can run Windows on your post-2011 Mac. If your Mac is older, or you have a MacBook Air or a Mac with only 2GB of RAM this probably will not work -- please make a plan to have a PC usable for the course. Regardless, you should get a cheap USB mouse for use with Windows (it will increase your productivity by about 50% when using Windows software on a laptop). If this presents a hardship, see me. History has shown that not dealing with this promptly (within the first four weeks of class) is a recipe for misery. You have been warned.

Grading

Lab Assignments and Preparation Sessions (12% of grade). There are a total of six of these activities. All must be completed for full credit. Preparation tasks are due before class. Lab assignments are due by midnight on the day of the lab. The scoring is simple: on time (full credit), within a week (half-credit), otherwise (no credit). Your submission should resemble the assignment and get there on time, but they will not be carefully scrutinized or graded except for “being there”. Solutions will be posted. You may work together but should submit your own version.

Problem Sets (28% of grade). You must do the simulation problem set and three of the four other problem sets. These will be shorter than in the past. They are graded more carefully by dedicated graders. Any concerns about grading should be directed to the instructor (Prof. Hitt) – do not contact the graders directly. Solutions will be posted if we cannot return them in time for an exam. These can be done in groups of up to 3 students. Late assignments will not be accepted without advance permission (the chance of receiving permission depends on *why* you need to submit late and *when* you let me know; for some assignments there cannot be late submissions because we provide solutions in class).

Exams (60% of grade). There are two exams – one on Optimization and Processes (first half) and the second on Simulation, Decisions and Information Strategy. They are equally weighted and non-cumulative. The first will be in-class; the second will be on the assigned exam day. History has shown that nearly all the variance in grades is due to exam performance.

Class Participation. There is no objective class participation grade since I do not plan to keep attendance or score class comments. However, I consider class participation part of the social norm of the class. That includes participating occasionally and doing the preparation work. I have found that most people do a reasonable job here but I will adjust grades up or down as much as a full letter grade for exceptional performance in either direction. I will discuss expectations on the first day.

Collaboration. You are strongly encouraged to collaborate with your fellow students on working through the course material. However, any work which is handed in as an individual assignment must be written entirely and only by you, which includes doing your own versions of any computer generated text or diagrams. Problem sets done in small groups should have a common paper, submitted for each student (the paper should be submitted for all students and should be identical – please do NOT create different variations of the same group submission). Regardless, you must also explicitly identify any collaborators on your paper that were not in your group by listing the names at the beginning. You can work together on lab assignments, but should submit your own computer code (spreadsheet and/or sim model).

FAQs

What is the grade distribution? There is no official grade distribution but I generally award 30-35% A, 50-60% B. Lower grades result from repeated poor performance on exams or violation of course norms (missed/late assignments, non-participation, inappropriate in-class conduct, use of electronic devices in class without permission).

Where can I get help? We have a lot of support for the class including instructor office hours, TA office hours, the Penn Tutoring Center, free private support by appointment (capacity permitting), private tutoring, and the online forum (Piazza). If you are concerned about this class, be sure to ask for help early.

Do I have to take OPIM101? Yes, unless you are M&T or a dual degree student in engineering or computer science. Ask me if you have questions about this.

Schedule Outline (Tentative – See Canvas for Actual Schedule)

| Date | Day | Session | Due* |
|------------|-----|---|-------------------------|
| 8/27/2014 | Wed | Course Introduction | |
| 9/1/2014 | Mon | No Class - Labor Day | |
| 9/3/2014 | Wed | Optimization I: Intro to Optimization | |
| 9/8/2014 | Mon | Optimization II: Sensitivity Analysis | Prep Exercise I Due |
| 9/10/2014 | Wed | Optimization III: Networks and Binary Variables | |
| 9/15/2014 | Mon | Optimization Lab Session | Lab Assignment I |
| 9/17/2014 | Wed | Optimization III (part 2): Applications (continued) | |
| 9/22/2014 | Mon | Optimization IV: Advanced Optimization and Nonlinear Models | No Exercise Due |
| 9/24/2014 | Wed | Optimization VI: Project Management | |
| 9/29/2014 | Mon | Operations I: Introduction and Inventories | Optimization PS (1) |
| 10/1/2014 | Wed | Operations II: Processes | |
| 10/6/2014 | Mon | Process Management Lab Assignment | Lab Assignment II |
| 10/8/2014 | Wed | Simulation I: Introduction to Simulation | |
| 10/13/2014 | Mon | Simulation II: Basics and Monte-Carlo | Process Analysis PS (2) |
| 10/15/2014 | Wed | (Optional) Review Session | |
| 10/20/2014 | Mon | Midterm (In class) | Midterm |
| 10/22/2014 | Wed | Simulation III: Discrete Events and Queueing | |
| 10/27/2014 | Mon | Simulation Lab Session: Build a Sim Model | Lab Assignment III |
| 10/29/2014 | Wed | Simulation IV: Validation and Verification | |
| 11/3/2014 | Mon | Decision Analysis I: Structured Decision Making | Prep Exercise II Due |
| 11/5/2014 | Wed | Decision Analysis II: Decision Theory Applications | |
| 11/10/2014 | Mon | Decision Analysis III: Games | Simulation PS (3) |
| 11/12/2014 | Wed | Decision Analysis IV: (more) Games and Decision Biases | |
| 11/17/2014 | Mon | Info Econ I: Introduction to Information Economics | Prep Exercise III Due |
| 11/19/2014 | Wed | Info Econ II: Information Strategy and Pricing | |
| 11/24/2014 | Mon | Info Econ III: Relationship Risks | Decision PS (4) |
| 11/26/2014 | Wed | No Class (Break) | |
| 12/1/2014 | Mon | Info Econ IV: Pot Luck | No Exercise Due |
| 12/3/2014 | Wed | Course Conclusion | |
| 12/8/2014 | Mon | (optional) Review Session | Info Strategy PS (5) |