Simulation and Optimization
ITAO 40150

Office: 337 Mendoza

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Office Hours

Monday through Thursday: 10:00 to 12:00

Most Fridays: 10:00 to 2:00

Class Days and Time

Monday and Wednesday: Stayer B003

- Section 1: 2:00 - 3:15
- Section 2: 3:30 - 4:45

Course Objectives

By the end of the course, you will be able to:

- Identify problems that can be solved using advanced quantitative techniques, like linear programming and simulation.
- Translate word-based optimization problems into mathematical expressions for further programming.
- Know when to apply specific types of optimization problems.
- Recognize how statistical distributions can be related to real-life situations.
- Program simulations using programming languages of your choice.

Course Activities

Readings

There is no *official* textbook for this course. There will, however, be readings posted for each topic. You are not committed to the readings, but they will certainly provide an expanded understanding of the content.

Class Exercises

After learning a topic, you will work individually in class to solve one or two questions related to the new topic. Although these exercises will not be graded, you will get much more out of them then listening to me talk about how to do these things.

Homework

There will be three assignments which will be graded. These assignments and suggested due dates will be announced during the class. Each person should turn in their own assignment, but you are absolutely free to collaborate with people in class. Collaboration does not meaning copying – it means that you have worked together to solve the problem and both people have their own unique answers to the problem. It is advised to start the assignments early and bring questions to office hours.

A significant portion of your grade will come from the homework skills map. The skills roadmap has different levels (bronze, silver, and gold). Each level must be completed in order (i.e., you cannot skip silver and go straight to gold from bronze). Silver and gold levels essentially act as modifiers to not only your grade, but also your understanding.

Please feel free to work together on the bronze level of homework (i.e., not the optional sections), but each assignment needs to be your own work. Putting your heads together to formulate an analytic attack plan is perfect (we all stands on the shoulders of giants), but copying and pasting text from each other is unacceptable. In other words, your code and words should not look like one of your classmate's.

Midterm

The midterm will require programming. However, the scope of the midterm is limited to only a few topics.

Presentations

The final for this class will be a group presentation (and accompanying write-up). You will be graded on the in-class presentation, the write-up, and peer evaluations.

Grading

Daily Work – 50 points (16%)

Homework – 90 points (29%)

Midterm Exam – 70 points (23%)

Final Presentation – 100 points (32%)

Total – 310 points

Schedule

Table 1: Tentative Schedule

	Week	Date	Topic	Assignments
1	1	08/24 (T)	Software Prep	
2		08/26 (Tr)	R Markdown	
3	2	08/31 (T)	Linear Programming 1	HW1
4		09/02 (Tr)	Linear Programming 2	
5	3	09/07 (T)	Process Simulation 1	HW2
6		09/09 (Tr)	Process Simulation 2	
7	4	09/14 (T)	Midterm Review	
8		09/16 (Tr)	Midterm	
9	5	09/21 (T)	Integer Programming	
10		09/23 (Tr)	Monte Carlo Simulation 1	HW3
11	6	09/28 (T)	Monte Carlo Simulation 2	
12		09/30 (Tr)	Project Day	
13	7	10/05 (T)	Project Day	
14		10/07 (Tr)	Presentations	