

DATA SCIENCES AND OPERATIONS

SPRING 2023 SEMSTER

DSO 516 — *Probability and Data*

Modeling

Professor

Austin Pollok

Email

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When

Wednesday, 6:30 PM - 9:30 PM

Office

BRI 307 J

Units

1.5



WHY TAKE THIS COURSE?

- Students who are interested in the application of probability theory to data analysis.
- Students who want an applicable, hands-on course that explains how to model various types of data. This depends very much on knowledge of common distributions and data structures, so you will learn what is appropriate in which situations.

COURSE OBJECTIVES

The course goals are for each student to come away with a detailed knowledge of how to work with, and understand, uncertainty. Many business decisions are made with imperfect information, so understanding the methodology and process for handling the unknown is critical. Probability theory will help with this and Python computations (Excel optional) will be critical in applying these ideas to real situations.

KEY CONCEPTS

- Modeling uncertainty
- Distribution functions
- Laws of large numbers
- Sampling
- Statistics and data analysis
- Python skills (Spreadsheet skills optional)

Together, we will build probability models for problems in various industries including:

- Finance and quantitative trading
- Blockchain and crypto
- Music and streaming services

COURSE DESCRIPTION

Uncertainty is everywhere. Our objective is to use probability theory to find structure in this uncertainty. We will do this by building probability models from data, which can then be used as inputs for simulation models. Simulation types we will address are Monte Carlo and Discrete-event models that focus on incorporating variability in a process.