

# DATA SCIENCES AND OPERATIONS

Spring 2024

## DSO 516 –

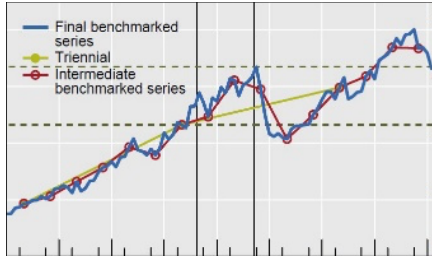
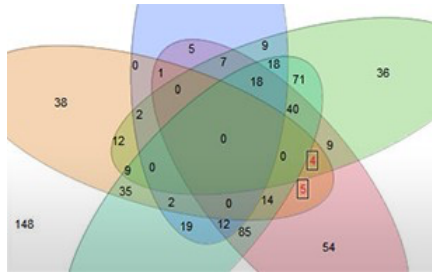
*Probability & Data Modeling*  
Section(s) 16307/16308

**Professor:** Dawn Porter

**Email:** [dcporter@marshall.usc.edu](mailto:dcporter@marshall.usc.edu)

**When:** T/Th, 12:30pm–1:50pm  
(first half of the semester)

**Office:** BRI 307C      **Units:** 3.0



## WHY TAKE THIS COURSE?

- Students completing this course will have a strong understanding of probability concepts, both in theory and in application.
- Examples from finance, marketing, economics, accounting, information systems, etc., are used to illustrate applications of the material covered. Emphasis will be placed on Excel to analyze datasets.
- Many common probability distributions will be presented, along with the context in which they are typically found. Using this information as a base, students will simulate various options for a set of data and determine which choice is most appropriate.

### 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 Excel computations will be critical in applying these ideas to real situations.

### KEY CONCEPTS

Together, we will build probability models for demand prediction, evaluation of quality of service, capacity planning, portfolio allocation, and more. Key concepts include:

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

### 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.