### Methods and Computing

DoSS Summer Prep Bootcamp 2025

## 1 Time & Place

Exact times TBA.

## 2 Instructor

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## 3 Course Outline

This course will revisit foundational programming principles in R and review of essential concepts in likelihood inference.

### 4 Textbooks

#### Primary textbooks:

All of Statistics by L. Wasserman (AoS) Statistical Inference, Second Edition by George Casella and Robert L. Berger (C&B)

#### **Optional texts**:

Statistical Models by A.C. Davison Mathematical Statistics by K. Knight Theory of Point Estimation by E.L. Lehmann

# 5 Tentative Lecture Schedule

The lecture topics and corresponding texts are outlined below. This schedule is tentative and may be changed as the course progresses.

Module	Topics	References
1	R, Rstudio, and Rmarkdown	-
	Basic data types and structures	
2	Reporting, data wrangling and graphing (I)	-
	LaTeX, tidyverse	
3	Reporting, data wrangling and graphing (II)	-
	Elementary data analysis	
	ggplot and R style guide	
4	Probability distributions	AoS Chp 1-5
	Statistical inference (I)	AoS Chp 6
	Fundamental concepts in inference	
5	Statistical inference (II)	C&B Chp 6.3, 7
	Maximum likelihood estimation	AoS Chp 3-4
6	Statistical inference (III)	AoS Chp 8
	Hypothesis testing	C&B Chap 8
7	Statistical models (I)	AoS Chp 13
	Linear regression models	C&B Chp 11
8	Statistical models (II)	C&B Chp 12
	Generalized linear models	AoS Chp 13
9	Simulation and parallel computing	C&B Chap 10
		AoS Chp 24
10	Bootstrap	AoS Chp 5