

# Methods and Computing

## *DoSS Summer Prep Bootcamp 2023*

### 1 Time & Place

July 10 to 28, online synchronous. 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 (YT)	R, Rstudio, and Rmarkdown Basic data types and structures	-
2 (YT)	Reporting, data wrangling and graphing (I) LaTeX, tidyverse	-

3 (JG)	Reporting, data wrangling and graphing (II) Elementary data analysis <code>ggplot</code> and <code>Github</code>	-
4 (JG)	Probability distributions Statistical inference (I) Fundamental concepts in inference	AoS Chp 1-5 AoS Chp 6
5 (JG)	Statistical inference (II) Maximum likelihood estimation	C&B Chp 6.3, 7 AoS Chp 3-4
6 (JG)	Statistical inference (III) Hypothesis testing	AoS Chp 8 C&B Chap 8
7 (YT)	Statistical models (I) Linear regression models	AoS Chp 13 C&B Chp 11
8 (YT)	Statistical models (II) Generalized linear models	C&B Chp 12 AoS Chp 13
9 (JG)	Simulation and parallel computing	C&B Chap 10 AoS Chp 24
10 (YT)	Bootstrap	AoS Chp 5