DoSS Summer Prep Bootcamp 2025 *Probability*

1 Time & Place

TBD

2 Instructor

Ichiro Hashimoto, 3rd year PhD student, Department of Statistical Sciences

3 Course Outline

Basics of probability theory, distribution theory of random variables, moments and inequalities, and limit theorems with examples and counterexamples.

4 Textbooks

The main reference for this course are the lecture notes, which will be made available on the course website as we progress through the course. The following books were used in preparing the course, and are recommended textbooks for STA2111H Graduate Probability I and STA 2211H Graduate Probability II.

Recommended textbooks:

Probability, Theory and Examples by Rick Durrett A First Look at Rigorous Probability Theory by Jeffery S. Rosenthal

5 Tentative Lecture Schedule

The lecture topics and corresponding chapters in the texts (if applicable) are outlined below. This schedule is tentative and will inevitably be augmented during the course.

Lecture	Topics
1	Basics of Probability
	Introduction to measure theory
2	Random Variables
	Distribution, Independence
3	Common Random Variables
	Exponential family
4	Distribution, Functions of random variables
	Change of variables, order statistics
5	Expectation
6	Inequalities
7	Inequalities continued
	Examples and counterexamples
8	Stochastic Convergence
9	Limit Theorems
10	Limit Theorems continued
	Examples and counterexamples