Random Variables

- Random Variables and Distributions $(3.1 - 3.2)$.
- Cumulative Density Function (3.3)
- Joint, Conditional, Marginal Distributions $(3.4 - 3.6)$
- Expectation (4.1)
- Properties of Expectation (4.2)
- Variance (4.3)
- Conditional Expectation (4.7)

Special Distributions

- Useful Families of Distributions (all in Chapter 5):
    - Discrete: Bernoulli, Binomial, Geometric.
    - Poisson Distribution
    - Exponential Distribution.
    - Normal Distribution.
- Recap: Central Limit Theorem.

CLT and Inference

- ▶ The sample mean (Chapter 6.2 - Properties of the sample mean).
- ▶ Central Limit Theorem (Chapter 6.3).
- ▶ Statistical Inference (Chapter 7.1).
- ▶ The likelihood function (part of Chapter 7.2).
- ▶ MLE estimation (Chapter 7.5)

Sampling Distributions of estimators

- ▶ Sampling distributions of estimators: definition, why do we care. (Chapter 8.1)
- ▶ Sampling distributions of estimators for the normal distribution. (Chapter $8.2, 8.3$)
- ▶ The $Gamma$ and χ^2 distribution. (Chapter 5.7, 8.2)
- ▶ The t-distributions (Chapter 8.4 - without the pdf derivation)
- ▶ Confidence Intervals (Chapter 8.5-up to $8.5.6$)
- ▶ Unbiased estimators (Chapter 8.7)