

# STAT 515 Fall 2024 Class Schedule

Ray Bai

## Basic Set Theory and Probability

- 8/21/24: syllabus and course overview, introduction to sets
- 8/23/24: basic set theory, basics of probability
- 8/26/24: basics of probability, counting rules
- 8/28/24: counting rules, conditional probability
- 8/30/24: independence, conditional independence, Bayes Theorem
- 9/2/24: **Labor Day (no class)**
- 9/4/24: Bayes Theorem, random variables

## Probability Distributions

- 9/6/24: probability distribution, expected value, and variance for discrete random variables
- 9/9/24: Bernoulli trials, binomial distribution
- 9/11/24: binomial distribution, Poisson distribution
- 9/13/24: continuous probability distributions, uniform and exponential distributions
- 9/16/24: normal distribution
- 9/18/24: calculating probabilities and quantiles with the normal distribution

*End of Exam 1 material*

## Sampling Distributions and Central Limit Theorem

- 9/20/24: random sample, sampling distributions
- 9/23/24: sampling distribution of the sample mean, Central Limit Theorem (CLT)
- 9/25/24: sampling distribution of the sample proportion, more examples of the CLT
- 9/27/24: Review for Exam 1
- 9/30/24: checking normality in small samples, bootstrap to approximate sampling distributions
- 10/2/24: **Exam 1 (in class)**

## Confidence Intervals for Means and Proportions

- 10/4/24: confidence interval for population mean (variance known)
- 10/7/24: confidence interval for population proportion
- 10/9/24: variance estimation, chi-square distribution, confidence interval for population variance
- 10/11/24: confidence interval for population mean (unknown variance),  $t$ -distribution
- 10/14/24: confidence interval for population mean (unknown variance), bootstrap intervals
- 10/16/24: sample size calculations, margin of error
- 10/18/24: **Fall break (no class)**

## Hypothesis Testing for Means and Proportions

- 10/21/24: hypothesis test for population mean (variance known), Type I and Type II errors
- 10/23/24: hypothesis test for population mean (variance unknown)
- 10/25/24: hypothesis test for population proportion
- 10/28/24: p-values
- 10/28/24: p-values, connections between testing and confidence intervals
- 11/1/24: effect size, power of a test

*End of Exam 2 material*

## Two-Sample Inference

- 11/4/24: confidence interval and hypothesis test for difference of two independent means
- 11/6/24: confidence interval and hypothesis test for matched pairs
- 11/8/24: review for Exam 2
- 11/11/24: **Exam 2 (in class)**
- 11/13/24: confidence interval and hypothesis test for difference of two proportions

## One-Way ANOVA and Simple Linear Regression

- 11/15/24: comparative experiments, one-way ANOVA, checking assumptions for one-way ANOVA
- 11/18/24:  $F$ -distribution,  $F$ -test for one-way ANOVA
- 11/20/24:  $F$ -test for one-way ANOVA
- 11/22/24: Pearson's correlation coefficient, simple linear regression (SLR)
- 11/25/24: **Thanksgiving holiday (no class)**
- 11/27/24: **Thanksgiving holiday (no class)**
- 11/29/24: **Thanksgiving holiday (no class)**
- 12/2/24: checking assumptions for SLR
- 12/4/24: inference for the slope in SLR
- 12/6/24: review for final exam
- 12/13/24: **Final Exam from 12:30-2:30 pm**