

# STAT 517 Fall 2022 Class Schedule

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\* This schedule is *tentative* and may be subject to change.

## Review of Linear Regression Models

- **8/19/22:** syllabus and course overview, review of R
- **8/22/22:** review of simple and multiple linear regression model and model assumptions
- **8/24/22:** estimation and inference with the linear model
- **8/26/22:** predictive modeling, prediction with the linear model

## Models for Binary Response Variables

- **8/29/22:** generalized linear models (GLMs), fitting GLMs in R
- **8/31/22:** binomial responses, simple logistic regression
- **9/2/22:** multiple logistic regression
- **9/5/22: Labor Day (no class)**
- **9/7/22:** inference for logistic regression
- **9/9/22:** deviance and residuals for logistic regression
- **9/12/22:** probit regression and complementary log-log regression
- **9/14/22:** model selection for binary response regression
- **9/16/22:** prediction with binary regression, receiver operating curve (ROC) analysis
- **9/19/22:** confusion matrix, performance metrics for binary regression

## Models for Count Response Variables and Contingency Tables

- **9/21/22:** Poisson responses, Poisson regression
- **9/23/22:** inference and goodness of fit for Poisson regression
- **9/26/22:** grouped data and offset, overdispersion in count regression models
- **9/28/22:** modeling excess zeros in count regression
- **9/30/22:** analysis of two-way contingency tables
- **10/3/22:** log-linear models for two-way contingency tables
- **10/5/22:** three-way contingency tables, mutual and joint independence
- **10/7/22:** conditional independence, uniform association, and model selection

## Models for Multinomial Responses

- 10/10/22: multinomial data, multinomial logit model
- 10/12/22: conditional logit and hierarchical logit models
- 10/14/22: models for ordinal responses

## Random Effects and Mixed Effects Models

- 10/17/22: fixed vs. random effects
- 10/19/22: random effects models
- 10/21/22: repeated measures and longitudinal data
- 10/24/22: mixed effects models for continuous responses
- 10/26/22: mixed effects models for non-normal responses

## Nonparametric/Semiparametric Regression and Classification

- 10/28/22: motivation for nonparametric regression, kernel regression
- 10/31/22: splines, loess regression
- 11/2/22: additive models
- 11/4/22: generalized additive models
- 11/7/22: decision tree modeling
- 11/9/22: regression trees and classification trees
- 11/11/22: tree ensemble methods (boosting and random forests)
- 11/14/22: variable importance in tree methods
- 11/16/22:  $k$ -nearest neighbor regression and classification

## Penalized Regression

- 11/18/22: multicollinearity in linear regression, ridge regression
- 11/21/22: ridge regression, cross-validation
- 11/23/22: **Thanksgiving holiday (no class)**
- 11/25/22: **Thanksgiving holiday (no class)**
- 11/28/22: traditional model selection methods for linear regression
- 11/30/22: lasso regression
- 12/2/22: choosing between ridge regression and lasso regression