

# STAT 515: Statistics for Biomedical Researchers

Statistical analyses are a fundamental component of experimental design in many biomedical research fields. Particularly when working with large, messy data, proper understanding of statistics is essential to perform proper statistical analyses. This course will build on students' existing knowledge of statistics to help them expand their analysis toolkits and will cover topics including modeling, bootstrapping, simulations, imputation, and basic machine learning. Students will attend lectures to gain theoretical understanding of topics before applying concepts through practice problems and projects using the R programming language. Note that students should have basic proficiency in R and simple statistical analyses before enrolling in this course to be successful.

## Learning Objectives

By the end of this course, students should be able to:

- Fit and interpret multiple regression models including interaction and non-linear terms
- Fit and interpret logistic regression models
- Evaluate model fit to perform model selection
- Perform bootstrapping and simulation analyses to quantify statistical confidence
- Fit basic machine learning models
- Understands the strengths and weaknesses of different machine learning models.

**Credits:** 2

**Class Type:** Graduate Course

**Program:** Bioinformatics and Data Science

**Availability** Summer 2022