Syllabus for STAT 630: Statistical Methods
Fall 2019

Instructor: Dr. Eric Fox
Office: SC-N 303A
Email: `eric.fox@csueastbay.edu`

Lecture:

Section 1	Tu 3:15PM – 4:55PM at SC-N 215 Th 3:15PM – 4:55PM at SC-S 146
Section 2	Tu 8:00PM – 9:40PM at SC-N 215 Th 8:00PM – 9:40PM at SC-S 146

Office Hours: Tu, Th 5-7PM or by appointment

Website: Course materials will be posted on Blackboard.

Textbooks: Diez, D., Barr, C. and Cetinkaya-Rundel M. *OpenIntro Statistics*, 4th Edition, 2019. [Free PDF: `https://www.openintro.org/stat/textbook.php`]

Chihara, L. and Hesterberg T. *Mathematical Statistics with Resampling and R*. 2nd Edition, 2018. [Free electronic version: `http://library.csueastbay.edu/home`]

Software:
R, can be downloaded here `https://www.r-project.org/`
RStudio, can be downloaded here `https://www.rstudio.com/`

Course Topics: This course will provide an introduction to statistical methods and their applications. Topics include exploratory data analysis, statistical inference, and linear regression. Weekly computer labs will provide training in the use of the statistical programming language R.

- Data collection: sampling designs and experimental studies
- Descriptive statistics
- Probability distributions (normal, t, binomial, Chi-square)
- Sampling distributions
- Central Limit Theorem
- Confidence intervals
- Hypothesis testing

- Resampling methods (the bootstrap and permutation tests)
- Simple linear regression and correlation
- Chi-square tests for goodness-of-fit and independence

Grading: There will be weekly problem sets and computing lab assignments. There will also be two midterm exams and a final exam. Homework assignments will emphasize concepts and theory, and should be turned in during class. Lab assignments will focus on data analysis and programming in R, and should be submitted online to Blackboard. Exams may have both in-class and take-home components. Attendance and completion of all assignments is essential for your success in this class.

- 15% Homework
- 15% Computing Labs
- 40% Two Midterm Exams (20% each)
- 30% Final Exam: Tu Dec 10, 3-5PM (section 1), 8-10PM (section 2)

Policy on Make-up Exams and Late Assignments: If you miss an exam due to an emergency or illness and provide documentation I may agree to a make-up, or count your other exams proportionally more. Late homework and labs will not be accepted. However, your lowest scoring homework and lab assignment will be dropped.

Student Learning Outcomes: Upon successful completion of this course, students will be able to:

- Apply statistical methodologies, including (a) summary statistics and graphical displays, (b) hypothesis testing and confidence intervals, and (c) linear regression and correlation.
- Derive and understand basic theory underlying these methodologies.
- Use R and RStudio to analyze data sets and implement statistical methods.
- Understand basic R programming, including vectors and data frames, subsetting, looping and control structures, simulation and resamping techniques.
- Communicate statistical concepts clearly and appropriately to others.

Common Syllabus Items: Items such as policies on academic dishonesty, disability, and handling emergency situations can be found under "University Policies" on Blackboard.