Syllabus Math 615 Fall 18

Course Description

Introduction to common procedures used to analyze data. Single and two-sample inference, analysis of variance, multiple regression, analysis of co-variance, experimental design, repeated measures, nonparametric procedures, and categorical data analysis. Examples will be drawn from Biology and related disciplines. Statistical computer packages will be introduced. Appropriate for biology, agriculture, nutrition, psychology, social science, and other majors. 3 hours discussion.

Logistics

Instructor: Dr. Robin Donatello
Office Location: Holt 202
Phone Number: 898-5767
E-mail: rdonatello@csuchico.edu
Prerequisites: Basic computer literacy. Recent statistics course such as Math 105, MATH 315, or MATH 350.
Meeting Days and Times TR 11-12:15, Holt 155
Office Hours TBD
Class Website https://norcalbiostat.github.io/MATH615/
Slack Channel http://math615.slack.com You will be sent an email invitation to your campus email.
Google Drive You will be added to the Math 615 Team drive using your campus email.

You can download the Syllabus in PDF form by clicking [this link].

Learning Outcomes

By the end of the semester students will be able to

- Import data into a statistical analysis software program in a format that is ready to analyze.
- Process, screen, recode, transform, and clean data.
- Describe distributions and patterns of data using visualizations and words.
- Select and carry out an appropriate statistical analysis.
- Explain study results and limitations to a non-technical audience.
- Understand and implement a reproducible research pipeline.
- Become a data nerd (Optional, but recommended).

Required Materials

- **Textbook**: *Practical Multivariate Analysis, 5th ed* by Afifi, May Clark. Available cheaper at Amazon
- **Reliable Laptop**: Expect to bring often. Contact me if this poses a problem or concern for you.
- **Reliable internet** connection while on and off campus. ITSS can help you get this setup.
- **Computer Software:** Data Analysis is done using statistical analysis software. Common statistical programs include SAS, STATA, R and SPSS. I am fluent in SAS, STATA and R, but can provide limited support for SPSS. The choice of software you use for this class is up to you, but you will be expected to learn how to navigate the programs outside of class time.

Optional

- Open Intro Statistics 3rd edition. If you need a refresher on your basic statistics. Free PDF available at https://www.openintro.org/stat/textbook.php?stat_book=os
- Chico R Users Google Group. This is our discussion forum to ask (and answer) questions outside of class. **I do not answer coding questions over email.**
  - https://groups.google.com/forum/#!forum/chico-rug
- The R Users Meetup group useful if you want to stay connected to the community and learn about upcoming events.
  - https://www.meetup.com/Chico-R-Users-Group/

Grading

- Your final grade will be a straight sum of points earned and will be displayed as a running total in Blackboard Learn.
- The approximate contributions per category are: Participation 13%, Written Assignments 20%, Exams 25%, and Project related assignments 40%.
  - Think of the written assignments as a draft version 1 of analyses that you will refine and present as part of your cumulative project.
- I use a standard grade cutoff of 100-90%: A, 89-80%: B, 79-70%: C, 69-60%. Plusses and minuses will be as displayed on Blackboard Learn.
- Extra Credit can be earned through Slack participation. By asking and answering questions you can contribute to quality class-wide generation. Helping each other is more valuable than waiting for a response from me. Regular participation throughout the semester can earn you up to 10 points (~2%).

Schedule of Topics

The general ordering of topics is:

- Data Collection and recording
- Preparing data for analysis
- Data Visualization
- Foundations for Inference: Random variables, Parameters vs. Statistic, Confidence Intervals, Hypothesis Testing
- Selecting appropriate analyses
- Inference comparing multiple samples (t-tests, ANOVA, χ^2 tests)
- Study Design
- Linear regression analysis (Simple and Multiple, Categorical predictors and contrasts)
- Logistic regression analysis
- Model building techniques and comparing model fit
- Special analysis topics - how to identify when linear regression models won't work.

Policies

Adding and Dropping the course

This course only runs for a few weeks and all materials are available on the course website. It will be difficult to get caught up if you add the class after the first week. The last day to add or drop classes without special

permission by the instructor is 9/7/18. No adds or drops are allowed after 9/21/18 without a serious and compelling reason approved by the instructor, department chair, and college dean.

Americans with Disabilities Act

If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations.

Accessibility Resource Center
530-898-5959
Student Services Center 170
arcdept@csuchico.edu

Chico State Basic Needs Project

The **Hungry Wildcat Food Pantry** provides supplemental food, fresh produce, CalFresh application assistance and basic needs referral services for students experiencing food and housing insecurity.

All students are welcomed to visit the Pantry located in the Student Service Center 196, open Monday-Friday, 11am-4pm or call 530-898-4098.

Please visit the Chico State Basic Needs website http://www.csuchico.edu/basic-needs for more information.