Course overview

This class came to be from suggestions from several of you due to insufficient or poorly covered material in other graduate statistics venues. Traditionally, a class such as this should pick up where BESC 412 left off; this would mean beginning the class with multiple regression, 2 factor and multivariate ANOVA, etc. However, there are some of you which have had no statistics whatsoever. Therefore, we must begin with a quick review of introductory material so that everybody starts at the same place. Those of you who have had 412, did so ≥ 2 semesters ago, so a review will be beneficial to all. Specific expected outcomes for this class include an understanding of statistical concepts and theories, the ability to perform statistical tests for the purposes of analyzing interpreting ecological data, the use of computers to analyze data statistically, and an understanding of the design and implementation of experiments.

Text

We should have a reference text for this class, and after buying 5 new books, I have not found a better one than the 412 text: Biostatistical Analysis, 5th edition, by Jerrold Zar. There are cheaper paperback versions which I would encourage you to take advantage of. The international version has the probability tables in the back like the hardback version. I suggest Amazon, Barnes and Noble, etc. This should be a book you keep for future reference, since most of you are looking at a career in mainline biological research.

Direction and Grade

Unlike BSC 412, I intend to make larger use of computer software to do the work for us. I intend to have user-friendly stat software installed on the machines in the computer lab 210. It is a package that I have used extensively and published from.

In this class, we will preface the topics under the question of “what test do I use and when”. Hence the applied aspect mentioned in the title. Formulas will be introduced, and examples worked in Class. Your grade will come in the form of problems sets using existing real data rather than formal exams. If you have a data set that might be suitable, let me know. It’s much more beneficial if you learn on data that is relevant to you. And that is the point: to learn how to analyze your data. From time to time, I will give out journal articles that discuss the techniques under discussion, which may show up as a discussion/essay question on a related problem set. I anticipate 4-5 problems sets as outlined below,
with a point value of 100 pts each. When we finish, we’re done; if that is before finals, so be it. As a graduate class, I want to keep the class open and free style as possible, but like all classes, it’s better if you attend class.

Obligatory statements:

**Code of Conduct.** All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment (see Student’s Guide Handbook, Policies and Procedures, Conduct).

Plagiarism is a criminal activity. You must cite all sources of information. Copying of material, whether parts of sentences, whole sentences, paragraphs or entire articles will result in a grade of zero for your assignment and can result in further disciplinary action. Note that this is true throughout the University and we do have plagiarism detecting software in place. Further information for avoiding this activity will be provided with your written assignments.

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**Students with disabilities:** The Americans with Disabilities Act (ADA) is federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact: **Office of Student Disability Resources and Services, Texas A&M University-Commerce, Gee Library, Room 132, (903)-886-5150, or (903)-886-5835, FAX (903)-468-8148, StudentDisabilityServices@tamu-commerce.edu.**
*The instructor reserves the right to change, alter, modify, this syllabus as needed; such changes will be announced in class before hand, so as to ensure a ‘no surprises’ approach to the class.

**TENTATIVE SCHEDULE**

**DESCRIPTIVE STATISTICS**

Week 1. Terminology, Concepts, Definitions
  Measures of Central Tendency

Week 2. Measures of Dispersion, Simple regression
  Introduction to Hypothesis testing: z’s, and t’s.

**Problem set 1.**

**CORRELATION AND REGRESSION**

Week 3. Simple linear regression, cont., Non-parametric regression

Week 4. Stepwise and Multiple Regression, Logistic Regression

Week 5. Information Theory-Model Selection, Correlation

**Problem Set 2**

**DESIGN OF EXPERIMENTS AND THE ANOVA**

Week 6. One-way ANOVA and the Completely Randomized Design

Week 7. Non-Parametric Approaches

Week 8. Multiple Factorial ANOVA, MANOVA

Week 9. Other Designs

**Problem Set 3.**

**CATEGORICAL ANALYSIS, CHI-SQUARE, AND WHATEVER REMAINS**

Week 10. Goodness of Fit, Tests of Independence, Log Likelihood and the G test

Week 11. Kaplan-Maier Survival Analysis

**Problem set 4.**