BSC 412—QUANTITATIVE BIOLOGY

Instructor: Dr. Dean Ransom, Jr.

Office: Science 212 **Office Hours**: M 10—12, 1-2:30, or by appointment.
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Course Objectives: The objective of this course is to provide students with the knowledge and understanding of the methods of statistical analysis applicable to biological research. Emphasis will be placed on the concepts and application of statistical thinking. Basic probability theory, parametric and non-parametric statistics including t-test, ANOVA, regression and correlation will be introduced.

Textbook: Zar, Jerrold, H. **Biostatistical Analysis 5th edition**. Prentice Hall, Upper Saddle River, New Jersey. This book will be available in the university bookstore, likely with substantial mark up in price. It is also available from Amazon.com, Barnes and Noble.com, and likely from the publisher; perhaps for a lesser price.

Grading:

3 Exams @100 pts each	300 points
Problem sets 3* @100 pts each	300 points

Problem sets, computer software: For most of the semester, problems will be worked by hand, and detailed on the board in class. However, to accompany lecture, I will hand out problem sets for you to work on before the exam. There will also be some computer assignments for "in class" work towards the end of the semester. There are lots of statistical software packages that you can use, but SPSS will be the package that we will attempt to use in class; it is installed on class computers. SPSS and Mini-TAB are installed on computers in the library. MS Exel can also be programed to do statistical analyses. There are likely free packages available on the net, like Stat Cruncher or R. Assignments requiring the use of

computer software will be given in the later sections of the class for procedures difficult to do by hand.

Expectations and responsibilities of students:

Regular attendance in lecture is expected. Exams will be based on material contained in the Book and lectures. The final exam is not comprehensive. I expect students to read the text chapters prior to lecture in which the topics are discussed.

Quantitative biology, statistics, biometry, or whatever it may be called is a central element in the education of wildlife and biology majors. Understanding in this course is achieved through reading the book, working the problem sets, and doing well on the exams. Early topics covered in the course lay the foundation for subsequent topics. This is a senior level class with the level of rigor appropriate for such a class. Statistics is by its very nature a difficult subject to master. DO NOT take this class lightly.

Make up exams are generally not permitted except in the case of serious illnesses or family emergencies; permission for make-up exams will be at the discretion of the instructor. Students must provide proof of legitimate excuse for missing exams before make-up opportunities are considered. If you are seriously ill and know in advance of the exam that you are not likely to make it, you will be required to get approval from the instructor for the make -up **PRIOR** to the scheduled exam.

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.

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.

Schedule

Week:	Topics Covered	Chapter
1(19 Jan)	Populations and Samples, **Problem set 1**	1-4
	Measures of Central Tendency, Dispersion	
2	Dispersion, Probabilities, Normal Distribution	5-6.2
3	**Exam I**, One sample hypotheses , **Problem set 2**	6.3-7
4	2 sample hypotheses	8
5	Paired sample hypotheses	9 TCTWS
6	Analysis of Variance, **Problem set 3**	10
7	**Exam II**, Multiple comparisons	11
8	Simple linear regression	17, 18, 19
9	********Spring Break ********	
10	Correlation and Chi-square	19, 22
11	Testing for Goodness of Fit and Chi-square.	22,23
12	Work on Problem set 3	
13	Problem set 3 continued	
14	Finish up, Review, whatever is left.	
15(11May)	**Exam III**, Finals exams begin	