BSC 412 – Quantitative Biology

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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, correlation, regression, and other quantitative methods will be introduced.

Undergraduate Grading

Exam 1	100 points
Exam 2	100 points
Exam 3	100 points
FINAL EXAM	100 points
Homework Assignments	160 points
	560 total points

Textbook: Zar, Jerrold, H., Biostatistical Analysis, 4th Edition, Prentice Hall, Upper Saddle River, New Jersey, ISBN# 978-0-13-100846-5

Homework and computer laboratory exercises: Most lecture topics will be accompanied by homework assignments and or computer lab exercises. Homework assignments will consist of problems assigned from the textbook and computer lab exercises will be given out in the computer lab. ***All homework is due the following Monday. Write-ups from computer lab exercises are due 1 week after they are assigned.***

Expectations and responsibilities of students:
Regular attendance in lecture is expected. Exams will be based on material contained in the assigned readings **AND** lectures. Final exam will cover material from the entire course.

Students are expected to read the text chapters prior to lecture in which the topics are discussed. Some exam questions will be based solely on required readings.
Students are expected to complete all homework and computer laboratory assignments.

UNDERSTANDING IN THIS COURSE IS ACHIEVED THROUGH DOING THE HOMEWORK AND COMPUTER EXERCISES. EARLY TOPICS COVERED IN THIS COURSE LAY THE FOUNDATION FOR SUBSEQUENT TOPICS. FAILURE TO

COMPLETE THE HOMEWORK ASSIGNMENTS WILL ULTIMATELY LOWER YOUR TEST SCORES AND MAKE THE COURSE MORE DIFFICULT.

Make-up exams are generally not permitted except in the case of serious illnesses or family emergencies; permission for make-exams will be at the discretion of the instructor. Make-up exams will never be given without proof of a legitimate excuse for missing class on the date of exams. 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 exam **PRIOR** to the scheduled exam date.

Obligatory Statements:
All student 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 score 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 a 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, Phone (903) 886-5150 or (903) 886-5835, Fax (903) 468-8148,** StudentDisabilityServices@tamu-commerce.edu

Schedule (Tentative)

Week	Topics	Chapter
1/18	• Introduction • Populations and Samples • Measures of Central Tendency (***Homework Exercises 3.1-3.4***) • Measures of Dispersion and Variability	1-4
1/25	• Measures of Dispersion and Variability (cont.) (***Homework Exercises 4.1-4.3***) • Probabilities (***Homework Exercises 5.1-5.14***) • Normal Distribution (***Homework Exercises 6.2-6.6***)	5-6
2/1	• One-sample Hypotheses (***Homework Exercises 7.1-7.7a,b***) **FRIDAY Meet in Computer lab Science 210**	7
2/8	• Two-sample Hypotheses (***Homework Exercises 8.1-8.7, 8.12-8.14***) • **EXAM 1 (Friday)**	8
2/15	• Experimental Design • Paired-sample Hypotheses (***Homework Exercises 9.1-9.3***) **WEDNESDAY Meet in Computer lab**	9
2/22	• Analysis of Variance (ANOVA) (***Homework Exercises 10.1-10.5***) **FRIDAY Meet in Computer lab**	10
3/1	• Multiple Comparisons • Two-factor and Multiway factorial Analysis of Variance	11 12 &14
3/8	• No lectures – Work on extra credit assignment	
3/22	• **MONDAY Meet in Computer lab** • Data Transformations • **EXAM 2 (FRIDAY)**	13
3/29	• Simple Linear Regression **FRIDAY Meet in Computer lab**	17
4/5	• Comparing Linear Regression Equations • Simple Linear Correlation • **FRIDAY Meet in Computer lab**	18 19
4/12	• Multiple Regression and Correlation **TUESDAY Meet in Computer lab**	20
4/19	• **EXAM 3** • Testing for Goodness of Fit, Chi-Square	22-23
4/26	• **TBD**	
5/3	• **TBD**	
5/10	• **Finals Week**	