

## ANSC5312/NRM5312/BIOL5316 - Biostatistical Analysis I Course Syllabus - Fall 2015

### **Instructor**

Name: Richard B. Mrozinski

Office: RAS 118

Office Hours: During lab and by appointment

Also I will generally be in my office on Mondays 3-5, Tuesdays 9-noon, and Tuesdays 1-2. Feel free to stop by any time you see me in my office. I will generally not be in the office on Thursdays and Fridays, but still available by phone, text, or e-mail.

Phone: 832-228-7130 (Fastest way to reach me. Feel free to text)

Email: [rbm14fk@sulross.edu](mailto:rbm14fk@sulross.edu) (Will be checked at least once daily)

### **Course Description**

An introduction to statistical concepts and models applied to agricultural and biological systems. The course introduces the scientific method, inferential theory, data types, descriptive statistics, goodness of fit, contingency tables, the normal distribution, and one and two sample hypothesis testing. Emphasis will be placed on data analysis and interpretation of biological research using computer statistical applications.

### **Course Objectives**

This course addresses Program Learning Outcome 1 for the M.S. and 1 for the M.Ag. programs, which state that students should be able to: Apply statistical concepts and procedures to natural resource data.

Specific student outcomes will include the following:

1. Knowledge of various data types and the appropriate analysis for each type.
2. Ability to use sample data to estimate population parameters.
3. Ability to calculate measures of central tendency, dispersion, and variability.
4. Ability to calculate probabilities including permutations and combinations.
5. Knowledge of normal distributions, how to assess normality in data, and which statistical methods to use for normal and non-normal data.
6. Knowledge of the scientific method and how to apply it to research.
7. Ability to use parametric and non-parametric methods for testing 1-sample, 2-sample, and paired-sample hypotheses.
8. Ability to analyze nominal data using goodness of fit tests and contingency tables.
9. Ability to analyze dichotomous variables, circular distributions, and to test for randomness.
10. Ability to use SPSS software for statistical data analysis.

### **Class Meeting Time/Place**

Lecture/Lab: Monday, Wednesday 10:00 am -11:50 am

Lecture: NRM 129; Lab: NRM 126

### **Text and Supplies**

1. Zar, J. H. 2009. Biostatistical Analysis. Fifth edition. Prentice Hall, Inc. Upper Saddle River, NJ. (*Required*)
2. Norusis, Marija. 2011. SPSS Statistics 19 Guide to Data Analysis. Addison Wesley. (*Optional*)
3. Calculator (*Required*) Note: Use of internet-capable devices (e.g. smartphones) is not allowed for exams.

### **Course Outline**

1. Data Types and Presentation
2. Populations and Samples
3. Measures of Central Tendency
4. Measures of Variability and Dispersion
5. Probabilities
6. The Normal Distribution
7. One Sample Hypotheses
8. Two Sample Hypotheses
9. Paired Sample Hypotheses
22. Testing for Goodness of Fit
23. Contingency Tables
24. Dichotomous Variables
25. Testing for Randomness
26. Circular Distributions

### **Course Grade**

Exam I	20%
Exam II	20%
Final Exam	20%
Homework	20%
Final Project	20%

### **Grade Assignment**

<60 = F, 60-69 = D, 70-79 = C, 80-89 = B, 90-100 = A.

### **Class Organization and Policy**

Lecture and Lab are consecutive and attendance in both is essential. Lecture may run into lab if it is necessary to cover material, but in general the lab is set up for individual instruction. Please use this time wisely to work through examples, work on homework, and ask questions. It is unfair to other students to skip the individual lab instruction and then expect help during my office hours. I will be happy to help you during office hours if you are using lab time wisely. I will not be amenable to you skipping lab and then expecting personal instruction during my office hours.

Roll will be taken in each class meeting. The SRSU catalog states "The Instructor will drop a student from a course when the student has a total of nine absences. An absence is defined as nonattendance to 50 minutes of class."

Missed lecture notes may be obtained from a classmate. See me for handouts and assignments that may have been missed.

No make up exams will be given for an unexcused absence. You must notify me of an excused absence PRIOR to the class you will miss and arrangements for make up exams must be made BEFORE the exam is given.

Late assignments will be accepted at the discretion of the instructor, with a 10% penalty for each day that it is late. Late assignments will not be accepted once a full week has passed.

Academic dishonesty includes copying, sharing, or obtaining information from an unauthorized source, attempting to take credit for the intellectual work of another person, falsifying information, and giving or receiving information about a test, quiz, or assignment to other students. Any student involved in academic dishonesty will receive no credit (0) for work done and/or may be penalized in accordance with published University Rules.

*It is Sul Ross State University Policy to provide reasonable accommodation to students with disabilities. If you would like to request such accommodations because of physical, mental, or learning disability, please contact the ADA Coordinator for Accessibility Services in Ferguson Hall Room 112 or call 432-837-8203.*

***It is my hope that you find this course both enjoyable and informative!***

## **Additional Outcome Objectives as Required by the Southern Association of Colleges and Schools:**

### ***Program Learning Outcomes for the M.Agr. in Range and Wildlife Management***

The graduating student will demonstrate that he/she is able to:

1. Apply statistical concepts and procedures to natural resource data
2. Evaluate literature and references as they apply to the natural resource field
3. Demonstrate their knowledge of the fundamentals and advanced concepts of range and wildlife management.

### ***Program Learning Outcomes for the M.S. in Range and Wildlife Management***

The graduating student will demonstrate that he/she is able to:

1. Apply statistical concepts and procedures to natural resource data
2. Evaluate literature and references to substantiate an applied research project.
3. Examine, select, and utilize appropriate resources, materials, and data collection instruments to implement research projects.
4. Justify and defend the research questions and design.

### **Course Schedule**

Week 1	8/24	Course Overview & Chapter 1. Data Types and Presentation
	8/26	Chapter 2. Populations and Samples & Chapter 3. Measures of Central Tendency
Week 2	8/31	Chapter 4. Measures of Variability & Dispersion
	9/2	Chapter 5. Probabilities
Week 3	9/7	Labor Day Holiday
	9/9	Chapter 6. The Normal Distribution & Hypothesis Testing
Week 4	9/14	Chapter 6. The Normal Distribution & Hypothesis Testing
	9/16	Chapter 6. The Normal Distribution & Hypothesis Testing
Week 5	9/21	Exam I Review
	9/23	Exam I
Week 6	9/28	Exam I Results & Project Overview
	9/30	Chapter 7. One Sample Hypotheses
Week 7	10/5	Chapter 7. One Sample Hypotheses
	10/7	Chapter 7. One Sample Hypotheses
Week 8	10/12	Chapter 8. Two Sample Hypotheses
	10/14	Chapter 8. Two Sample Hypotheses
Week 9	10/19	Chapter 8. Two Sample Hypotheses
	10/21	Chapter 9. Paired Sample Hypotheses
Week 10	10/26	Chapter 9. Paired Sample Hypotheses
	10/28	Chapter 9. Paired Sample Hypotheses
Week 11	11/2	Exam II Review
	11/4	Exam II
Week 12	11/9	Exam II Results & Chapter 22. Testing for Goodness of fit
	11/11	Chapter 22. Testing for Goodness of fit
Week 13	11/16	Chapter 22. Testing for Goodness of fit
	11/18	Chapter 23. Contingency tables
Week 14	11/23	Chapter 23. Contingency tables
	11/25	Thanksgiving Holiday
Week 15	11/30	Information Theoretic Statistics Overview & Project work
	12/2	Bayesian Statistics Overview & Final exam review
Week 16	TBD	Final exam

### **Exam Schedule**

Exam I ~September 23 (tentative)

Exam II ~ November 4 (tentative)

Final Exam - TBD Week of 12/7

Project due date - Wednesday, Dec. 2