

ANSC5312/BIOL5316/NRM5312 - Biostatistical Analysis I

Course Syllabus - Fall 2019

Instructor

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Office Hours: - MW 1-2 (RAS); TR 10:45-11:30 & 1:45-2:30 (ACR); F 10-12 (RAS); or by appointment
- I also have "Open Door Office Hours". Feel free to come in anytime you see me in my office.
- You can reach me anytime from 8am - 4pm by text (preferred, fastest), phone, or e-mail (checked daily). We can even arrange Facetime/Skype calls.
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Teaching Assistant

Name: Barbara Sugarman
Office: RAS 117, Desk 11
Office Hours: MWF 9:00-10:00; T 10-12 (Barbara has "open door office hours" as well.)
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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 states 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.

Student Learning Objectives 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.

Student Learning Objectives 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

- Evaluate literature and references to substantiate an applied research project.
- Examine, select, and utilize appropriate resources, materials, and data collection instruments to implement research projects.
- Justify and defend the research questions and design.

Class Meeting Time/Place

Lecture/Lab: Monday, Wednesday 10:00 am -11:50 am
 Lecture: RAS 129 Lab: RAS 126

Text and Supplies

- Zar, J. H. 2009. Biostatistical Analysis. Fifth edition. Prentice Hall, Inc. Upper Saddle River, NJ. **(Required)**
- Subscription to Laerd Statistics (<https://statistics.laerd.com/>). **(Required before fourth class day, see below)**
- Calculator **(Required)** Note: Use of internet-capable devices (e.g. smartphones) is not allowed for exams.

Course Outline (Numbers given are the associated chapters in the textbook)

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

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. I expect a high level of engagement to enhance everyone’s learning. This includes interacting with the instructor and other students, asking questions during class, completing outside of class assignments and readings, and being prepared to participate in class discussions.

*Each student is **required to purchase** their own, individual subscription to Laerd Statistics **before our fourth class day**. In doing so, all students must agree to the Laerd Statistics Terms & Conditions. All students **MUST** subscribe individually and sign a statement of agreement to the Terms & Conditions; **failure to subscribe** and sign the statement of agreement will result in a **grade of “F”** for this class. Both the instructor and Laerd will verify your subscription. NOTE: from Laerd Statistics FAQ: “We do not allow the downloading or printing of any Laerd Statistics material (Premium or otherwise). This is to prevent any unauthorized spreading of the content to non-paying members.”*

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.” Any time class is missed, for any reason, it will be recorded as an absence. College-related events that conflict with class will not be considered an absence **ONLY WITH** my prior approval.

All lectures, labs, and assignments will be posted in Blackboard as PowerPoint files. Laerd content will **NOT** be included in these files due to Laerd’s “Terms and Conditions”, so class attendance is essential. If you miss class, it is advised you obtain any hand-taken notes from a classmate.

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 late** (i.e. 10% for 0-24 hours late, 20% for 24-48 hours late, etc.) Late assignments are not accepted after seven days. Extended due dates may be allowed due to college-related conflicts ONLY WITH my approval PRIOR to the due date. In case of emergencies, arrangements for completing assignments should be made immediately upon return to SRSU.

The use of personal laptops, cell phones, iPads, and other electronic devices can create distractions for learning, both for yourself and others. However, such devices can also be great tools to aid learning. Therefore, using electronic devices for class purposes (e.g. taking notes, working out problems, searching the internet) is allowed in silent mode. If you choose to use electronic devices in class, do so in a professional manner that does not impede others' learning. **The use of internet-capable devices (e.g. smartphones) is not allowed for exams.**

Academic Integrity

On all work submitted for credit by students at the university, the following pledge is implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

Unauthorized aid 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.

General Expectations

Statistics can be a very intimidating subject. However, you cannot survive in the biological sciences without knowing statistics. To maximize learning in this course, we should have some expectations of each other:

I expect from you:

- ATTEND lecture and lab; be on time as a courtesy to others.
- ASK whenever something is unclear. Preferably in class, as it is likely that others have the same question.
- PARTICIPATE in lecture and lab.
- READ the required sections from the text. If you come to me with a question and it is clear that you haven't read the book or the lecture notes, I will direct you to the reading first.
- DO all assignments, do them in a timely manner, and ensure I can read them! Parts of assignments that I can't read will not be graded. If you are late with assignments, it prevents me from returning others' assignments until I have yours in-hand.
- BE HONEST in all of your work.

What you can expect from me:

- GIVE 100% effort in teaching you the best I can.
- Make myself AVAILABLE to help outside of class.
- ANSWER all of your questions to the best of my knowledge, and if I don't know the answer I will find out.
- Be FAIR in all grading.
- Provide you with timely, constructive FEEDBACK regarding your work.

Reasonable Accommodations

Sul Ross State University is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Mary Schwartz, M. Ed., L.P.C., in Counseling and Accessibility Services, Ferguson Hall, Room 112. The

mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. Telephone: 432-837-8203 8691. E-mail: mschwartz@sulross.edu.

Tentative Course Schedule

Week 1	8/26	Course Overview, "Why Statistics", & Chapter 1. Data Types and Presentation
	8/28	Chapter 2. Populations and Samples & Chapter 3. Measures of Central Tendency
Week 2	9/02	Labor Day Holiday
	9/04	Chapter 4. Measures of Variability & Dispersion
Week 3	9/09	Chapter 5. Probabilities
	9/11	Chapter 6. The Normal Distribution & Hypothesis Testing
Week 4	9/16	Chapter 6. The Normal Distribution & Hypothesis Testing
	9/18	Chapter 6. The Normal Distribution & Hypothesis Testing
Week 5	9/23	Exam I Review
	9/25	Exam I
Week 6	9/30	Exam I Results & Project Overview
	10/02	Chapter 7. One Sample Hypotheses
Week 7	10/07	Chapter 7. One Sample Hypotheses
	10/09	Chapter 7. One Sample Hypotheses
Week 8	10/14	Chapter 8. Two Sample Hypotheses
	10/16	Chapter 8. Two Sample Hypotheses
Week 9	10/21	Chapter 8. Two Sample Hypotheses
	10/23	Chapter 9. Paired Sample Hypotheses
Week 10	10/28	Chapter 9. Paired Sample Hypotheses
	10/30	Chapter 9. Paired Sample Hypotheses
Week 11	11/04	Exam II Review
	11/06	Exam II
Week 12	11/11	Veterans Day holiday
	11/13	Draft Projects Due / Exam II Results & Chapter 22. Testing for Goodness of fit
Week 13	11/18	Chapter 22. Testing for Goodness of fit
	11/20	Thanksgiving Holiday
Week 14	11/25	Chapter 22. Testing for Goodness of fit
	11/27	Chapter 23. Contingency tables
Week 15	12/02	Chapter 23. Contingency tables / Project work
	12/04	Final Projects Due / Bayesian Statistics Overview / Final exam review
	12/06*	Final Exam

Exam Schedule

Exam I ~September 26 (tentative)

Exam II ~ November 7 (tentative)

*Final Exam -Friday December 06 10:15-12:15