Natural Resource Data Analysis - FOR 321
Spring 2022
4 credits, three 1-hour lectures, one 2-hour lab per week

Instructor:	Dr. Benjy Longworth
Office:	TNR 327
Email:	blongwor@uwsp.edu

Class Time:

Lectures	Tues, Thurs, Fri	8:00 - 8:50 am	TNR 120
Lab Section 1	Tuesday	9:00 - 10:50 am	TNR 322
Lab Section 2	Thursday	9:00 - 10:50 am	Various
Lab Section 3	Tuesday	12:00 - 1:50 pm	TNR 322
Lab Section 4	Thursday	1:00 - 2:50 pm	TNR 322

Final Exam: Tues 5/17/22   10:15am - 12:15pm

Office Hours:

Tuesday	2:00 - 3:00 pm
Friday	9:00 - 10:00 am

Office hours can be F2F or virtual – please see the Canvas Site for Zoom connection details.

Prerequisite(s): MATH 95 or MATH 100 or MATH 107 or suitable placement score. May not earn credit in both FOR 321 and MATH 255

Required Text: *Elementary Statistics: A Step by Step Approach* (9th Edition) by Allan G. Bluman

Materials: Scientific Calculator

Learning Outcomes: Students in this course will learn applied statistical principles and how to properly apply them in solving/addressing natural resource-based problems/needs. Upon completion of this course, students will be able to:

(1.) Use descriptive statistics to quantitatively summarize natural resource-based populations via sampling techniques, measures of center & variation, and graphics.

(2.) Apply rules of probability, and discrete & continuous distributions to determine probabilities in the context of natural resources.

(3.) Use one- and two-sample hypothesis tests to make statistically sound comparisons about means, variation, and proportions and to draw statistically sound conclusions therein.

(4.) Use correlation and regression analysis to describe the relationship between two or more natural resource attributes or to predict the value of one given the values of the others.

(5.) Use analysis of variance to perform hypothesis tests when comparing more than two means.

(6.) Use Microsoft Excel® to assist in objectives 1 - 5 where appropriate.

Natural resource professionals use these skills and the information gathered via these techniques to provide the information needed for wise stewardship of natural resources. Therefore, by gaining confidence in these skills, students will be establishing the

groundwork for a lifetime of providing, interpreting, and understanding the information needed to make a variety of stewardship-based decisions.

Society of American Foresters Accreditation/Program Competencies

If you are a forestry major, your degree is accredited by the Society of American Foresters. That body requires that accredited educational programs meet a total of 29 educational competencies. This course specifically contributes to the following competency:

- Mathematics. Students must know and be able to use the basic approaches and applications of mathematics and statistics for analysis and problem solving, as appropriate for the program's stated outcomes.

Grading

- *Exams.* There will be <u>three</u> 50-minute, mid-semester exams (each worth 40 points) and a 2-hour, comprehensive final exam worth 80 points. Exams will cover material from lectures and assigned textbook chapters.
- *Quizzes.* There will be <u>seven</u> quizzes, worth 5 points each, given throughout the semester. They will take place during the first 10 minutes of certain Friday lectures.
- *Lab assignments.* You will complete <u>ten</u> lab assignments throughout the semester, each worth 10 points.
- *Problem sets.* These will be assigned for each chapter, but are not graded nor should they be turned in.

Graded Item	Points	Percent of Total Points
Mid-semester Exam 1*	40	12.1 %
Mid-semester Exam 2*	40	12.1 %
Mid-semester Exam 3*	40	12.1 %
Comprehensive Final Exam*	80	24.2 %
Quizzes (5 points each) **	30	9.1 %
Lab Assignments (10 points each)	100	30.3 %
Total	330	100 %

*   Instructor reserves the right to curve exam grades, *only* to your benefit.
**   Lowest quiz score will be dropped.

The percentages of points you earned will be rounded to the nearest tenth and course grades will be assigned as follows:

A	92.0 or higher	C+	76.0 to 78.9
A-	89.0 to 91.9	C	72.0 to 75.9
B+	86.0 to 88.9	C-	69.0 to 71.9
B	82.0 to 85.9	D+	66.0 to 68.9
B-	79.0 to 81.9	D	60.0 to 65.9
		F	59.9 or lower

Tips

1. Come to class ready to learn and with an open mind.
2. Keep up with the readings, problem sets, and lab assignments.
3. Partial credit, within reason, is sometimes awarded on exams. Therefore, you are *strongly encouraged* to show your work.

General Policy

1. Masks must be worn over nose and mouth while in the classroom.

2. Discussion of problem sets and lab assignments between students is encouraged; however, all lab assignments must be completed independently.

3. Cheating or plagiarism on exams, quizzes, or lab assignments will not be tolerated. Upon the first incident of academic misconduct, the Dean of Students will be notified, and the appropriate measures will be followed. Disciplinary action may result in failure of the course.

4. Any lab assignment turned in any time AFTER the designated time will be considered late and receive a 30% point reduction. If an assignment is late by one month, it will receive a score of zero.

5. All work is expected to be neat and well organized. Test or lab assignment answers that are illegible will receive a score of 0.

6. During exams, final answers must be written in pen, no hats may be worn, and phones must be turned off and out of sight. You will be allowed to have one sheet of paper with notes and formulas during the exam.

7. Audio recordings of lectures are permitted, but may not be shared with anyone outside of the class.

UWSP Academic Standards and Disciplinary Action: https://www.uwsp.edu/dos/Documents/UWSP14-Final2019.pdf

Attendance Policy

1. Attendance of lectures is crucial to your success in this class. Difficult concepts will be explained, and example problems will be demonstrated.

2. Attendance of your lab section is mandatory. Unexcused absences will result in a zero on that week's assignment. Attending a lab section other than your registered section will not be allowed unless pre-approved by the instructor.

3. If you have to miss a quiz, exam or lab due to a medical or family emergency, do your best to try to notify me ahead of time to explain why you will be unable to attend class at the scheduled time. If you are unable to notify me ahead of time, please notify me as soon as possible after the class period. Unexcused absences from quizzes, exams or labs result in zeroes.

4. If you are feeling sick do not come to class and follow university COVID testing guidelines.

5. If you test positive for COVID or have been in close contact with someone who tests positive for COVID, follow the university guidelines for quarantine procedures. Notify me of your circumstance (your information will be kept confidential) and do not come to class until your quarantine is complete.

6. In the case of missing class due to illness or family emergency, you will be given an opportunity to make up missed work.

UWSP COVID Testing Protocol: https://www.uwsp.edu/coronavirus/Documents/Covid-Testing-Jan2022.pdf

Students with Disabilities:
The university has a legal responsibility to provide accommodations and program access as mandated by Section 504 and the Americans with Disabilities Act (ADA). The university's philosophy is to not only provide what is mandated, but also convey its genuine concern for one's total well-being. If accommodations are needed, please contact the instructor as well as the Disability Services and Adaptive Technologies Center, 609 Library Resources Center, voice (715) 346-3365 or TDD (715) 346-3362

Lecture Outline

Week	Week of	Topic(s)	Readings	Assessments*
1	1/24	Introduction to Course Fundamentals of Statistics Frequency Distributions	Ch. 1, Ch. 2	
2	1/31	Graphs Descriptive Statistics	Ch. 3	Quiz 1
3	2/7	Probability Counting Rules	Ch. 4	
4	2/14	Discrete Distributions Normal Distributions	Ch. 5, Ch. 6	Quiz 2
5	2/21	Continuous Distributions Confidence Intervals	Ch.7	Test 1 (2/25)
6	2/28	Hypothesis Testing One Sample Tests of Means	Ch. 8	
7	3/7	One Sample Tests of Variation One Sample Tests of Proportions	Ch. 8	Quiz 3
8	3/14	Two Sample Tests of Means	Ch. 9	
-	3/21	**Spring Break**	-	-
9	3/28	Two Sample Tests of Variation Two Sample Tests of Proportions	Ch.9	Quiz 4
10	4/4	Correlation Simple Linear Regression	Ch. 10	Test 2 (4/1)
11	4/11	Multiple Regression Data Transformations	Ch. 10	Quiz 5
12	4/18	One-Way Analysis of Variance (ANOVA) Post Hoc Tests	Ch. 12	
13	4/25	Two-Way Analysis of Variance (ANOVA) Experimental Design	Ch. 12	Quiz 6
14	5/2	Chi-squared Tests	Ch. 11	Test 3 (5/6)
15	5/9	Non-Parametric Statistics	Ch. 13	Quiz 7
16	5/16	Comprehensive Final: Tues 5/17 10:15 am		

* All quizzes and tests will be on Fridays.

Laboratory Outline

Note that labs will not meet the first week of class (1/25 or 1/27) or the week before final exams (5/10 or 5/12).

Week #	Week of	Topic(s)/Applications	Assigned Work
1	1/24	No lab	-
2	1/31	Introduction to Excel Part I Frequency Distributions	Lab Assignment 1
3	2/7	Introduction to Excel Part II Descriptive Statistics	Lab Assignment 2
4	2/14	Probability	Lab Assignment 3
5	2/21	Normal Distributions Exam 1 Review	-
6	2/28	Confidence Intervals	Lab Assignment 4
7	3/7	One Sample Tests of Means	Lab Assignment 5
8	3/14	One Sample Tests of Variation and Proportions	Lab Assignment 6
-	3/21	No lab (Spring Break)	-
9	3/28	Two Sample Tests of Means	Lab Assignment 7
10	4/4	Two Sample Tests of Variation and Prop. Exam 2 Review	-
11	4/11	Correlation and Scatterplots	Lab Assignment 8
12	4/18	Simple Linear Regression	Lab Assignment 9
13	4/25	Single Factor ANOVA	Lab Assignment 10
14	5/2	Two-Factor ANOVA Exam 3 Review	-
15	5/9	No lab	-
16	5/16	No lab (Exam Week)	

Note the above schedules are a guide. The instructor reserves the right to make minor changes to the schedules based on assessment of class progress during the semester and needs identified therein.