

Natural Resources Data Analysis (FOR 321/521) Spring 2021
(4 credits, three 50 minutes lectures, one 1 hour and 50 minutes lab)

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Final Exam: Wednesday May 19, 2021. It will be an online exam; I will open the exam from 8:00 am to 11:59 pm on that day. Let me know ahead if you cannot take the exam on that date, I can open the exam on some other dates (during the exam week) based on individual requests from the students.

Zoom Office Hours: Tuesday from 2:00 to 3:00 pm and Thursday 2:00 to 3:00 pm. I will send you a zoom link in an email. If you cannot come to the zoom office hours, please send me an email, we can set up an appointment to talk outside of office hours. Please do not hesitate to ask if you have questions. If you call my office number (above phone number), please leave me a message with a call back number, I will give you a call.

Prerequisite(s): Either Math 95 or Math 100 or Math 107 or suitable placement test score.

Required Text: Bluman, A.G. 2014. *Elementary Statistics: A Step by Step Approach*, 9th Edition. McGraw Hill. ISBN 978-0-07-353498-5

Recommended Reading: Zar, J.H. 1999. *Biostatistical Analysis*, 4th Edition. Prentice Hall.

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

- (1.) Understand various sampling techniques used to collect data and use descriptive statistics to quantitatively summarize natural resource-based populations via 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, variations, and proportions and to draw statistically sound conclusions therein.

- (4.) Use analysis of variance to perform hypothesis tests when comparing more than two means.
- (5.) 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.
- (6.) Use Microsoft Excel® to assist in objectives (1.) through (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.

Grading:

There will be two mid-semester online exams (each worth 70 POINTS) and an 80-POINT, comprehensive final online exam over the course of the semester. Exam material will include material discussed in lectures, labs, and any assigned readings. There will also be 7 homework assignments based on lectures and lab materials (each homework assignment will be worth 30 POINTS). Finally, there will be three quizzes (30 points total), each quiz is worth 10 POINTS. Professional Point: 10 points (it depends on your CANVAS presence; I will constantly monitor the time spent for this class in CANVAS). Instructor reserves the right for this point.

COURSE TOTAL POINTS: 470 POINTS

Normally, cumulative percentages will be rounded to the nearest tenth and course grades will be assigned as follows (instructor reserves the right to curve final cumulative grades, *only* to your benefit):

92.6% or higher	A	77.6% to 79.5%	C+	
89.6% to 92.5%	A-	72.6% to 77.5%	C	
87.6% to 89.5%	B+	69.6% to 72.5%	C-	
82.6% to 87.5%	B	67.6% to 69.5%	D+	
79.6% to 82.5%	B-	59.6% to 67.5%	D	Less than 59.6% F

CANVAS:

It is important to regularly follow course CANVAS. I will create modules for each week, in the week's module, I will create a separate lecture and lab page. All the power point pdfs., instructional videos, excel files, documents to read and download, assignments etc. will be on the page. At the

beginning of each week, I will send you an email (I will post the same email in announcement section of CANVAS) with instructions and to do list for each week.

Email/CANVAS Announcement:

Please regularly check your UWSP email and CANVAS announcements, especially at the beginning of each week. I will also send you emails and put announcements regarding assignments, quizzes, and exams.

Software requirement: This class uses excel for working with data, I hope all of you have access to excel in your personal computer, if not, you can use the TNR computer labs (TNR 322 and TNR 356) or other IT computer labs in Science, CPS, and CCC buildings. If you cannot go to campus computer labs and do not have access to excel in your personal computer, you must utilize “Remote Computer Lab”, please follow the link below to understand what remote lab is and how to use “UWSP Standard Remote Lab”. You can also borrow University laptops, please contact the University information technology service (link below).

<https://www.uwsp.edu/infotech/Pages/ComputerLabs/Remote-Lab.aspx>

[Equipment Loan - Information Technology | UWSP](#)

Instructor’s Tips (Please read):

- (1.) Come to class WILLING TO LEARN and HAVE FUN!
- (2.) Follow the course CANVAS regularly. Regularly monitor your UWSP email and CANVAS Announcements.
- (3.) Please use Zoom office hours as much as you can. It is one way to connect with your instructor and ask questions.
- (4.) Please do not hesitate to provide constructive feedback about the overall course or CANVAS set up of the course. Do not wait until the end of the semester to provide feedback. If you are struggling with the course content in CANVAS or struggling to navigate course content in CANVAS, please let me know as early as possible.
- (5.) Keep up with the videos, book chapters, readings, practice questions, and the homework assignments.
- (6.) If you cannot complete things on the due date, please communicate with me. I can work with you and help you to complete the assigned tasks.
- (7.) Partial credit, within reason, is often awarded. Therefore, you are STRONGLY ENCOURAGED to show your work at all times.

Instructor’s Rules:

- (1.) Discussion of homework between students is encouraged, however all work must be done independently.
- (2.) Cheating and/or plagiarism will not be tolerated.
- (3.) If you must miss an exam/quiz based on a medical or family emergency, do your best to try to notify me ahead of time to explain why you will be unable to take the exam/quiz at the scheduled

time. If you are unable to notify me ahead of time, please notify me as soon as possible after the exam/quiz time. Please also provide necessary evidence of the emergency if possible. Unexcused absences from exams result in zeroes.

- (4.) You can upload your homework and lab assignments in the respective assignment folder in CANVAS by 11:59 pm on the due date. Please communicate with me if for some reason you cannot finish the assignment by the due date. I can be flexible enough and allow you more time to finish your assignments.
- (5.) All work is expected to be neat and well organized. Work that is sloppy and/or difficult to read will be returned ungraded. The student will then have 1 week to resubmit in a neat format, however, only 50% of the original points are available on resubmitted work.

Attendance Policy:

I will regularly monitor your activity in CANVAS, I will know how much time each student spent in the class. Your professional point will be based on the time you spent in the course and on your diligence with the homework and the lab assignments.

Professionalism Statement:

Students in the College of Natural Resources are pursuing courses of study that prepare them for careers as natural resources professionals. Thus, CNR students and faculty/staff are expected to exhibit conduct and attitudes appropriate to professionals. Conduct and attitudes appropriate for professionals include, but are not restricted to,

1. The UWSP Student Rights and Responsibilities (see below)
2. Attitudes appropriate for resource professionals of the 21st Century:
 - a. Respect for others and for their ideas;
 - b. Appreciation for ethnic and gender diversity in the workplace;
 - c. Sensitivity to environmental quality;
 - d. Adherence to professional ethics, e.g. the Society of American Foresters Code of Ethics.

Therefore, academic misconduct will not be tolerated.

UWSP 14.03 ACADEMIC MISCONDUCT SUBJECT TO DISCIPLINARY ACTION:

- (1.) Academic misconduct is an act in which a student:
 - (a) Seeks to claim credit for the work or efforts of another without authorization or citation;
 - (b) Uses unauthorized materials or fabricated data in any academic exercise;
 - (c) Forges or falsifies academic documents or records;
 - (d) Intentionally impedes or damages the academic work of others;
 - (e) Engages in conduct aimed at making false representation of a student's academic performance;

or

 - (f) Assists other students in any of these acts.

(g) Violates electronic communication policies or standards as agreed upon when logging on initially.

(2) Examples of academic misconduct include, but are not limited to: cheating on an examination; collaborating with others in work to be presented, contrary to the stated rules of the course; submitting a paper or assignment as one's own work when a part or all of the paper or assignment is the work of another; submitting a paper or assignment that contains ideas or research of others without appropriately identifying the sources of those ideas; stealing examinations or course materials; submitting, if contrary to the rules of a course, work previously presented in another course; tampering with the laboratory experiment or computer program of another student; knowingly and intentionally assisting another student in any of the above, including assistance in an arrangement whereby any work, classroom performance, examination or other activity is submitted or performed by a person other than the student under whose name the work is submitted or performed.

UWSP 14.04 DISCIPLINARY SANCTIONS:

(1) The following are the disciplinary sanctions that may be imposed for academic misconduct in accordance with the procedures of s. UWSP 14.05, 14.06 or 14.07:

- (a) An oral reprimand;
 - (b) A written reprimand presented only to the student;
 - (c) An assignment to repeat the work, to be graded on its merits;
 - (d) A lower or failing grade on the particular assignment or test;
 - (e) A lower grade in the course;
 - (f) A failing grade in the course;
 - (g) Removal of the student from the course in progress;
 - (h) A written reprimand to be included in the student's disciplinary file;
 - (i) Disciplinary probation; or
 - (j) Suspension or expulsion from the university.
- (2) One or more of the disciplinary sanctions listed in sub. (1) may be imposed for an incident of academic misconduct.

For more details on policies regarding academic misconduct, see:

<http://www.uwsp.edu/acadaff/HLCSelfStudy/Community%20Rights%20and%20Responsibilities%202011.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 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 and Assistive Technology Center, Room 609 in the Albertson Hall. You can also call at 715 346 3365 or email at datctr@uwsp.edu.

Additional information is available at:
<http://www.uwsp.edu/special/disability/>

LECTURE SCHEDULE

Weeks	Lecture Topic	Relevant Chapters	Homework
Week 1 (Jan 25-29)	Syllabus, Learning Objectives, Stat Concepts	1-1, 1-2,1-3	
Week 1 (Jan 25-29)	Central Tendency/Measures of Variation	3-1,3-2,3-3	
Week 1 (Jan 25-29)	Measures of Variation/Frequency Distribution/Graph	2, 3-1,3-2,3-3	
Week 2 (Feb. 1-Feb. 5)	Intro to Probability	4-1 through 4-3	
Week 2 (Feb. 1-Feb. 5)	Probability/Counting!	4-3, 4-4 through 4-5	
Week 2 (Feb. 1-Feb. 5)	More Counting!	4-4 through 4-5	
Week 3 (Feb. 8-Feb.12)	Probability Distributions	5-1 through 5-2	HW 1 Assigned
Week 3 (Feb. 8-Feb.12)	Discrete Distributions (QUIZ 1)	5-3 through 5-4	
Week 3 (Feb. 8- Feb.12)	Discrete Distributions	5-3 through 5-4	
Week 4 (Feb. 15- Feb.19)	Normal Distribution	6-1 through 6-2	HW1 Due; HW 2 Assigned

Week 4 (Feb. 15- Feb.19)	Normal Distribution	6-3 and 6-4	
Week 4 (Feb. 15- Feb.19)	Other Continuous Distributions; Hypothesis Testing	8-1 through 8-3, 8-6	
Week 5 (Feb. 22- Feb.26)	Hypothesis Testing	8-1 through 8-3, 8-6	HW 2 Due HW 3 Assigned
Week 5 (Feb. 22- Feb.26)	Review Exam1		
Week 5 (Feb. 22- Feb.26)	Online EXAM 1	Exam is Friday Feb. 26	Open from 8:00 am to 11:59 pm.
Week 6 (Mar. 1- Mar. 5)	Testing Single Variance or Standard Deviation	8-5	
Week 6 (Mar. 1- Mar. 5)	<i>P</i> values and Hypothesis Testing	8-2,8-3	HW 3 Due
Week 6 (Mar. 1- Mar. 5)	Testing Two Means (Large Sample)	9-1, 9-2	HW 4 Assigned
Week 7 (Mar. 8- Mar. 12)	Testing Two Means (Small Sample)	9-1, 9-2	
Week 7 (Mar. 8- Mar. 12)	Testing Two Variances	9-5	
Week 7 (Mar. 8- Mar. 12)	Testing Dependent Means	9-3	HW 4 Due
Week 8 (Mar. 15- Mar. 19)	Testing a Single Proportion (QUIZ 2)	8-4	
Week 8 (Mar. 15- Mar. 19)	Testing Two Proportions	9-4	
Week 8 (Mar. 15- Mar. 19)	Confidence Intervals	7, 8-6	HW 5 Assigned
Week 9 (Mar. 22 – Mar. 26)	SPRING BREAK	SPRING BREAK	SPRING BREAK
Week 10 (Mar. 29 – Apr. 2)	Confidence Intervals and Proportions	7, 8-6	HW 5 Due

Week 10 (Mar. 29 – Apr. 2)	Correlation and Regression	10-1 through 10-2	
Week 10 (Mar. 29 – Apr. 2)	Correlation and Regression	10-1 through 10-2	
Week 11 (Apr. 5 – Apr. 9)	Simple Linear Regression	10-1 through 10-4	
Week 11 (Apr. 5 – Apr. 9)	REVIEW EXAM 2		
Week 11 (Apr. 5 – Apr. 9)	Online EXAM 2	Exam 2 is Friday April 9	Open from 8:00 am to 11:59 pm.
Week 12 (Apr. 12 – Apr. 16)	Simple Linear Regression	10-1 through 10-4	HW 6 Assigned
Week 12 (Apr. 12 – Apr. 16)	Simple Linear Regression	10-1 through 10-4	
Week 12 (Apr. 12 – Apr. 16)	Multiple Linear Regression; Regression Diagnostics	10-1 through 10-4; Material Not in Textbook	
Week 13 (Apr. 19 – Apr. 23)	Multiple Linear Regression; Regression Diagnostics	10-1 through 10-4; Material Not in Textbook	HW 6 Due
Week 13 (Apr. 19 – Apr. 23)	One-way ANOVA	12-1 and 12-2	
Week 13 (Apr. 19 – Apr. 23)	Completely Randomized Design and One-way ANOVA	12-1 and 12-2	
Week 14 (Apr. 26 – Apr. 30)	Completely Randomized Design and One-way ANOVA	12-1 and 12-2	HW 7 Assigned
Week 14 (Apr. 26 – Apr. 30)	Multiple Comparisons	12-1 and 12-2	
Week 14 (Apr. 26 – Apr. 30)	Factorial Design/ Two Way Anova	12-3	
Week 15 (May 3 – May 7)	Factorial Design/ Two Way Anova	12-3	
Week 15 (May 3 – May 7)	* χ^2 Goodness of Fit Test (QUIZ 3)	11-1, 11-2	

Week 15 (May 3 – May 7)	* χ^2 Tests of Independence and Homogeneity of Proportions	11-1, 11-2	HW 7 Due
Week 16 (May 10 – May 14)	*Non-Parametric Procedures	13	
Week 16 (May 10 – May 14)	Left open for spill over		
Week 16 (May 10 – May 14)	REVIEW FOR FINAL EXAM		
Wednesday, May 19	Online FINAL EXAM	Open from 8:00 am to 11:59 pm.	

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

*These topics will be covered only if we finish the earlier topics on the scheduled time.

LAB SCHEDULE

Week	Lab Topic
Week 1 (Jan. 25- Jan. 29)	Intro to MS Excel
Week 2 (Feb. 1- Feb. 5)	More with MS Excel, Descriptive Statistics, Frequency distribution, Graphing
Week 3 (Feb. 8- Feb.12)	Probability Exercise; Discrete Distribution Exercise
Week 4 (Feb. 15-Feb.19)	Normal Distribution Exercise
Week 5 (Feb. 22- Feb.26)	One Sample Hypothesis Test Exercise
Week 6 (Mar. 1- Mar. 5)	Two Sample Hypothesis Test Exercise; Using MS Excel for One Sample Hypothesis Tests

Week 7 (Mar. 8- Mar. 12)	Using MS Excel for Two Sample Hypothesis Tests
Week 8 (Mar. 15- Mar. 19)	Writing Hypothesis Statements Exercise
Week 9 (Mar. 22 – Mar. 26)	SPRING BREAK
Week 10 (Mar. 29 – Apr. 2)	Proportions and Confidence Interval Exercise (including MS Excel)
Week 11 (Apr. 5 – Apr. 9)	Using MS Excel for Correlation and Regression
Week 12 (Apr. 12 – Apr. 16)	Using MS Excel for Multiple Regression/ANOVA
Week 13 (Apr. 19 – Apr. 23)	Using MS Excel for ANOVA
Week 14 (Apr. 26 – Apr. 30)	Using Excel for Two-way ANOVA and Chi-square
Week 15 (May 3 – May 7)	Left open for spill over
Week 16 (May 10 – May 14)	Review of Confusing Topics

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

Forestry Anti-harassment Statement

Introduction

In adopting this statement, the forestry discipline within the College of Natural Resources (CNR), at the University of Wisconsin-Stevens Point (UWSP) has expectations for professional behavior of its students, staff, faculty, and other associated parties. Anyone who has a reasonable belief that they, or another student, staff, faculty or guest, have been the victim of harassment, bullying, or discrimination, or any other violation in the statement herein, are encouraged and expected to report the conduct. See reporting options and guidelines at the end of this document.

The forestry discipline within the College of Natural Resources is committed to creating a safe, inclusive, and professional environment. The forestry discipline operates under the UWSP harassment, discrimination, and retaliation prevention guidelines, copied here:

“The University of Wisconsin-Stevens Point (UWSP) is committed to fostering an environment that is safe, respectful, and inclusive to all and to educate all employees on these important issues. In addition,

we are obligated, under Regent policy and federal regulations, to ensure our employees are informed on the issues of unlawful discrimination, harassment, and sexual violence.”

Statement

The forestry discipline, following the lead of the Society of American Foresters which accredits the B.S. forestry degree, believes we all have a responsibility in creating a safe, inclusive, professional environment in all forestry-related activities and events. All forms of discrimination, harassment, and bullying are prohibited. This applies to all participants in all settings (online and in-person) and locations (on- and off-campus) where forestry classes and associated activities are conducted, including student organization events and activities, committee meetings, workshops, conferences, and other work and social functions where employees, volunteers, sponsors, vendors, or guests are present.

Discrimination is prejudicial treatment of individuals or groups of people based on their race, color, creed, religion, age, sex, sexual orientation, gender identity or expression, national origin, ethnicity, ancestry, disability, pregnancy, marital or parental status, veteran status, or any other category protected by law.

Sexual harassment is unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature that creates an intimidating, hostile, or offensive environment. Sexual harassment constitutes discrimination and is illegal under federal, state, and local laws.

Bullying is unwelcome, aggressive behavior involving the use of influence, threat, intimidation, ridicule, hazing or coercion to dominate others in the professional environment. Bullying behavior may go beyond characteristics protected by applicable laws, including but not limited to, political views, dress, or other outward physical appearances.

Other types of harassment include any verbal or physical conduct directed at individuals or groups of people because of their race, ethnicity, color, national origin, sex, sexual orientation, gender identity, age, religion, disability, veteran status, or any other characteristic protected by applicable laws, that creates an intimidating, hostile, or offensive environment.

The following list, while not exhaustive, includes examples of unacceptable behavior: slurs, jokes, threats, or derogatory comments relating to the characteristics noted above. Examples of inappropriate physical harassment that violate this statement include, but are not limited to: assault, unwanted touching, or impeding or blocking movement. In addition, no individual may be denied admission to, or participation in or the benefits of, any UWSP-associated events. Similarly, the display or circulation of derogatory or demeaning posters, cards, cartoons, emails, texts, videos, and graffiti which relate to characteristics noted above violate this statement.

Reporting

Students, staff, faculty, or guests associated with Forestry-related programming who experience or witness incidents of harassment are strongly encouraged to report the incident. The Forestry discipline strongly urges the prompt reporting of complaints or concerns so that rapid and constructive action can be taken.

Reporting can be done online or in person, to a faculty or staff member, and/or the UWSP Dean of Students. Anonymous reporting is available.

The UWSP Title IX Website is the home for all information related to harassment and discrimination, including reporting options, student and employee resources, and information about what happens after a report is submitted:

<https://www.uwsp.edu/titleix/Pages/default.aspx>