Natural Resources Data Analysis (FOR 321/521)   Spring 2020
(4 credits, three 50 minutes lectures, one 1 hour and 50 minutes lab)

INSTRUCTOR:	Nilesh Timilsina	
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Class Time:

Lectures	Tue., Thur., & Fri.	8:00 am - 8:50 am	TNR 120
Lab 1	Tue.	9:00 am - 10:50 am	TNR 361*
Lab 3	Tue.	12:00 pm - 13:50 pm	TNR 361*
Lab 2	Thur.	9:00 am - 10:50 am	TNR 361*
Lab 4	Thur.	13:00 pm - 14:50 pm	TNR 361*

*According to your online course schedule, above classes are indicated as your lab class rooms, but THIS IS INCORRECT. Labs will be held in Computer labs. Please see the schedule below for your labs (I WILL ALSO SEND YOU EMAIL REMINDERS TO KEEP YOU POSTED ABOUT LAB CLASSES. IT IS IMPORTANT TO CHECK YOUR EMAIL EVERY WEEK, ESPECIALLY BEFORE THE LAB CLASSES).

Lab 1	**Tue.**	**9:00 am - 10:50 am**	**TNR 356**
Lab 3	**Tue.**	**12:00 pm - 13:50 pm**	**TNR 356**
Lab 2	**Thur.**	**9:00 am - 10:50 am**	**TNR 356**
Lab 4	**Thur.**	**13:00 pm - 14:50 pm**	**TNR 356#**

 # Three labs (March 5, April 16, and May 7) for this day and time are in TNR 322 (ACL).

Final Exam:	Tuesday May 12, 2020	10:15 am – 12:15 pm

Office Hours: Wednesday from 10:00 am to 12: 00 pm and Friday 9:00 am to 11:00 am. You can also stop by my office anytime for quick questions (provided the door is open). We can also meet by appointment, please send me an email beforehand to arrange the date and time to meet.

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 exams (each worth 70 POINTS) and an 80-POINT, comprehensive final 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. Quizzes will be at the start of a class (10 minutes). Professional Point: 10 points (it depends on your lecture and lab attendance and on your interaction during the class). 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. Many important announcements, readings, homework, and labs will be on CANVAS.

Email:

I will send important announcements via email; therefore, it is important to frequently check your uwsp email. I will also inform about lab classrooms changes via email.

Instructor's Tips:

(1.) Come to class WILLING TO LEARN and HAVE FUN!
(2.) Keep up with the readings and the homework assignments.
(3.) 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.) Homework and lab assignments are due at the START of the LECTURE/LAB PERIOD on the respective due dates. Any assignment turned in AFTER the start of lecture/lab will be considered late. Late assignments WILL NOT BE ACCEPTED OR INSTRUCTOR RESERVES THE RIGHT TO MAKE DECISION.

(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:

Both lecture and laboratory sessions are very important (it is in lab where you will often learn/review/and have hands on experiences with statistical applications) and every effort should be made to attend both. I WILL TAKE ATTENDANCE DURING EVERY LAB. I reserve the right to deduct, for each unexcused lab absence, POINTS from your lab grade. Absences due to illness, family emergency, or University-sponsored activities may be excused provided a written explanation is given to the instructor prior to the intended absence except for emergencies in which case an explanation should be handed in as soon as practical. If unexcused absences occur on days when assignments are due, then it is your responsibility to see that the assignment is turned in prior to class on the assigned due date in order to receive credit.

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/

Emergency Procedures
"In the event of a medical emergency, call 911 or use red emergency phone located outside TNR 151 and 172 (near the south entrance of TNR 170). Offer assistance if trained and willing to do so. Guide emergency responders to victim.

In the event of a tornado warning, proceed to the lowest level interior room without window exposure at TNR 170, 159, 157, 120, 122, Corridor 150 (corridor in front of TNR 157 and 159 on south side of TNR building). See http://www.uwsp.edu/rmgt/Pages/em/procedures/other/floor-plans.aspx for floor plans showing severe weather shelters on campus. Avoid wide-span rooms and buildings.

In the event of a fire alarm, evacuate the building in a calm manner. Meet at west/north side of TNR building at parking lot D or E (stay at least 200 yards away from the building). Notify instructor or emergency command personnel of any missing individuals.

Active Shooter – Run/Escape, Hide, Fight. If trapped, hide, lock doors, turn off lights, spread out and remain quiet. Follow instructions of emergency responders.

See UW-Stevens Point Emergency Management Plan at www.uwsp.edu/rmgt for details on all emergency response at UW-Stevens Point."

LECTURE SCHEDULE

Day, Date	Lecture Topic	Relevant Chapters	Homework
Tuesday, Jan. 21	Syllabus, Learning Objectives, Stat Concepts	1-1, 1-2,1-3	
Thursday, Jan. 23	Central Tendency/Measures of Variation	3-1,3-2,3-3	
Friday, Jan. 24	Measures of Variation/Frequency Distribution/Graph	2, 3-1,3-2,3-3	
Tuesday, Jan. 28	Intro to Probability	4-1 through 4-3	
Thursday, Jan. 30	Probability/Counting!	4-3, 4-4 through 4-5	
Friday, Jan. 31	More Counting!	4-4 through 4-5	

Tuesday, Feb. 4	Probability Distributions **(QUIZ 1)**	5-1 through 5-2	HW 1 Assigned
Thursday, Feb. 6	Discrete Distributions	5-3 through 5-4	
Friday, Feb. 7	Discrete Distributions	5-3 through 5-4	
Tuesday, Feb. 11	Normal Distribution	6-1 through 6-2	HW1 Due; HW 2 Assigned
Thursday, Feb. 13	Normal Distribution	6-3 and 6-4	
Friday, Feb. 14	Other Continuous Distributions; Hypothesis Testing	8-1 through 8-3, 8-6	
Tuesday, Feb. 18	Hypothesis Testing	8-1 through 8-3, 8-6	HW 2 Due HW 3 Assigned
Thursday, Feb. 20	**Review Exam1**		
Friday, Feb. 21	**EXAM 1**		
Tuesday, Feb. 25	Testing Single Variance or Standard Deviation	8-5	
Thursday, Feb. 27	*P* values and Hypothesis Testing	8-2,8-3	HW 3 Due
Friday, Feb. 28	Testing Two Means (Large Sample)	9-1, 9-2	HW 4 Assigned
Tuesday, Mar. 3	Testing Two Means (Small Sample)	9-1, 9-2	
Thursday, Mar. 5	Testing Two Variances	9-5	
Friday, Mar. 6	Testing Dependent Means	9-3	HW 4 Due
Tuesday, Mar. 10	Testing a Single Proportion **(QUIZ 2)**	8-4	
Thursday, Mar. 12	Testing Two Proportions	9-4	
Friday, Mar. 13	Confidence Intervals	7, 8-6	HW 5 Assigned

Mar. 17, 19, and 20	**SPRING BREAK**	**SPRING BREAK**	**SPRING BREAK**
Tuesday, Mar. 24	Confidence Intervals and Proportions	7, 8-6	HW 5 Due
Thursday, Mar. 26	Correlation and Regression	10-1 through 10-2	
Friday, Mar. 27	Correlation and Regression	10-1 through 10-2	
Tuesday, Mar. 31	Simple Linear Regression	10-1 through 10-4	
Thursday, Apr. 2	**REVIEW EXAM 2**		
Friday, Apr. 3	**EXAM 2**		
Tuesday, Apr. 7	Simple Linear Regression	10-1 through 10-4	HW 6 Assigned
Thursday, Apr. 9	Simple Linear Regression	10-1 through 10-4	
Friday, Apr. 10	Multiple Linear Regression; Regression Diagnostics	10-1 through 10-4; Material Not in Textbook	
Tuesday, Apr. 14	Multiple Linear Regression; Regression Diagnostics	10-1 through 10-4; Material Not in Textbook	HW 6 Due
Thursday, Apr. 16	One-way ANOVA	12-1 and 12-2	
Friday, Apr. 17	Completely Randomized Design and One-way ANOVA	12-1 and 12-2	
Tuesday, Apr. 21	Completely Randomized Design and One-way ANOVA	12-1 and 12-2	HW 7 Assigned
Thursday, Apr. 23	Multiple Comparisons	12-1 and 12-2	
Friday, Apr. 24	Factorial Design/ Two Way Anova	12-3	
Tuesday, Apr. 28	Factorial Design/ Two Way Anova	12-3	

Day, Date	Topic	Reading	Assignment
Thursday, Apr. 30	$*\chi^2$ Goodness of Fit Test **(QUIZ 3)**	11-1, 11-2	
Friday, May 1	$*\chi^2$ Tests of Independence and Homogeneity of Proportions	11-1, 11-2	HW 7 Due
Tuesday, May 5	*Non-Parametric Procedures	13	
Thursday, May 7	Left open for spill over		
Friday, May 8	REVIEW FOR FINAL EXAM		
Tuesday, May 12	**FINAL EXAM 10:15 am to 12:15 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

Day, Date	Lab Topic
Tuesday, Jan. 21 Thursday, Jan. 23	Intro to MS Excel
Tuesday, Jan. 28 Thursday, Jan. 30	More with MS Excel, Descriptive Statistics, Frequency distribution, Graphing
Tuesday, Feb. 4 Thursday, Feb. 6	Probability Exercise; Discrete Distribution Exercise
Tuesday, Feb. 11 Thursday, Feb. 13	Normal Distribution Exercise
Tuesday, Feb. 18 Thursday, Feb. 20	One Sample Hypothesis Test Exercise

Tuesday, Feb. 25 Thursday, Feb. 27	Two Sample Hypothesis Test Exercise; Using MS Excel for One Sample Hypothesis Tests
Tuesday, Mar. 3 Thursday, Mar. 5	Using MS Excel for Two Sample Hypothesis Tests
Tuesday, Mar. 10 Thursday, Mar. 12	Writing Hypothesis Statements Exercise
Tuesday, Mar. 17 **Thursday, Mar. 19**	**SPRING BREAK**
Tuesday, Mar. 24 Thursday, Mar. 26	Proportions and Confidence Interval Exercise (including MS Excel)
Tuesday, Mar. 31 Thursday, April 2	Using MS Excel for Correlation and Regression
Tuesday, April 7 Thursday, April 9	Using MS Excel for Multiple Regression/ANOVA
Tuesday, April 14 Thursday, April 16	Using MS Excel for ANOVA
Tuesday, April 21 Thursday, April 23	Using Excel for Two-way ANOVA and Chi-square
Tuesday, April 28 Thursday, April 30	Left open for spill over
Tuesday, May 5 Thursday, May 7	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.