

**Natural Resource Data Analysis (FOR 321)** Fall 2020  
(4 credits, online equivalent of three 1-hour lectures, one 2-hour lab)

|                     |                   |                  |
|---------------------|-------------------|------------------|
| <b>INSTRUCTORS:</b> | Dr. Paul Doruska  | Dr. Shuva Gautam |
| <b>OFFICE:</b>      | TNR 239           | TNR 367          |
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**Class Time:** Lectures: asynchronous online – material will be posted weekly.  
Lab Section 1: Mon. 12:00 pm - 1:50 pm virtual classroom  
Lab Section 2: Thurs. 3:00 pm - 4:50 pm virtual classroom

**Final Exam:** asynchronous online the week of December 14, 2020

|                      |                                    |                       |
|----------------------|------------------------------------|-----------------------|
| <b>Office Hours:</b> | Dr. Doruska                        | Dr. Gautam            |
|                      | Wednesday 10:00 am – 10:50 am, and | Will be shared in lab |
|                      | Thursday 1:00 pm - 1:50 pm         |                       |

Office hours will be virtual – please see the Canvas Sites for Zoom connection details. Questions can be posed via Canvas as well.

**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

**Text:** *Elementary Statistics: A Step by Step Approach* (9<sup>th</sup> Edition) by Allan G. Bluman

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**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 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, and
- (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.

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**Society of American Foresters Accreditation/Program Competencies:**

If you are a forestry major you know 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:**

There will be three timed mid-semester exams (each worth 50 POINTS) and a timed 75 POINT, comprehensive final exam over the course of the semester. Exam material will include material discussed in lectures, labs, and any assigned readings. Lecture and lab assignments (10 in total) will be worth 200 POINTS total. When determining final grades, the weight of one's lowest mid-semester exam score will carry ½ the weight of the other two mid-semester exam scores, and one's lowest lecture or lab assignment score will be dropped.

COURSE TOTAL POINTS (after adjustments/drops): 380 points.

Normally, cumulative-weighted 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 |

**Instructors' tips:**

- (1.) Come to class willing to learn and have fun, we certainly plan to do so.
- (2.) Keep up with the readings and the homework/lab assignments.
- (3.) Partial credit, within reason, is often awarded. Therefore, you are *strongly encouraged* to show your work at all times.

**Instructors' rules:**

- (1.) Discussion of homework and lab assignments between students is encouraged, however all work (unless part of any group projects) must be done independently.
- (2.) Cheating and/or plagiarism will not be tolerated (see also the Professionalism Statement)
- (3.) If you have to miss an exam 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 at the scheduled time. If you are unable to notify me ahead of time, please notify me as soon as possible after the exam time. Unexcused absences from exams result in zeroes.
- (4.) Homework and lab assignments are due at respective due dates/times. Any assignment turned in any time AFTER the designated time will be considered late. Late assignments will not be accepted.
- (5.) All work is expected to be neat and well organized. Work that is sloppy and/or difficult to read will be returned with a score of 0.

**Attendance Policy**

Lectures will be asynchronous online – you are expected to view them and complete any tasks relate to them in a timely manner. Laboratory sessions are very important (you will learn concepts in lectures and put them into practice in labs where you will also learn/review/and have hands on experiences with statistical applications) and every effort should be made to attend those virtual classroom labs. Absences from laboratories 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/times when assignments are due, then it is your responsibility to see that laboratory assignment is turned in prior to class on the assigned due date in order to receive credit. Switching laboratory sections to make up unexcused missed work is not allowed.

Missing/ignoring class and class material HABITUALLY almost always results in lower grades! You are strongly encouraged to attend all lectures.

**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

**Inclusive Environment:**

This course (and our university!) is an inclusive environment. This course might foster discussion, with respectful exchange of ideas and opinions. Disrespect and disparagement will not be tolerated. We have a great opportunity to learn from each other, and to appreciate and understand our differences. See also the CNR Principles of Professionalism, the Society of American Foresters Code of Ethics, and the Forestry Discipline's anti-harassment statement.

### **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 are available via: [www.uwsp.edu/centers/rights](http://www.uwsp.edu/centers/rights)
2. Attitudes appropriate for resource professionals of the 21<sup>st</sup> 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 and other professional organization's codes of ethics.

Therefore, academic misconduct will not be tolerated.

Note the following as per the Univ. of Wisc.-Stevens Point Community Bill of Rights and Responsibilities:

#### **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 (See [uwsp.edu/it/policy](http://uwsp.edu/it/policy)).

(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.

The College of Natural Resources at the University of Wisconsin – Stevens Point prepares students for success as professionals in many fields. As a professional, there are expectations of attainment of several personal characteristics. These include:

#### Integrity

**Integrity** refers to adherence to consistent moral and ethical principles. A person with integrity is honest and treats others fairly.

#### Collegiality

**Collegiality** is a cooperative relationship. By being collegial you are respecting our shared commitment to student education through cooperative interaction. This applies to all involved in the process: students, staff, faculty, administration and involved community members. You take collective responsibility for the work performed together, helping the group attain its goals.

#### Civility

**Civility** refers to politeness and courtesy in your interactions with others. Being civil requires that you consider the thoughts and conclusions of others and engage in thoughtful, constructive discussion to express your own thoughts and opinions.

#### Inclusivity

**Inclusivity** requires you to be aware that perspective and culture will control how communication is understood by others. While many values are shared, some are quite different. These differences in values should be both considered and respected.

#### Timeliness

**Timeliness** is the habit of performance of tasks and activities, planned in a way that allows you to meet deadlines. This increases workplace efficiency and demonstrates respect for others' time.

#### Respect for Property

**Respect for property** is the appreciation of the economic or personal value an item maintains. Maintaining this respect can both reduce costs (increase the operable life of supplies and equipment) as well as demonstrate respect for others rights.

#### Communication

**Professional norms in communication** require that you demonstrate the value of your colleagues, students, professors or others. The use of appropriate tone and vocabulary is expected across all forms of communication, whether that communication takes place face to face, in writing or electronically.

#### Commitment to Quality

**Quality** is the ability to meet or exceed expectations. By having a commitment to quality, we intend to provide a learning environment that is conducive to learning. Intrinsic to this commitment to quality is defining expectation (committed to in a syllabus through learning outcomes), implementation (with quality control in place) and assessment (where meeting of learning outcomes is determined).

#### Commitment to Learning

**Learning** is a lifelong process. By being committed to learning you are providing a model for all to follow. This model is not only professor to student but involves all combinations of people within our university and broader community

Adherence to this compact is required of the faculty and staff of the College of Natural Resources and of all students enrolled in College of Natural Resources courses.

## 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>

## **Preamble**

Service to society is the cornerstone of any profession. The profession of forestry serves society by fostering stewardship of the world's forests. Because forests provide valuable resources and perform critical ecological functions, they are vital to the wellbeing of both society and the biosphere.

Members of SAF have a deep and enduring love for the land, and are inspired by the profession's historic traditions, such as Gifford Pinchot's utilitarianism and Aldo Leopold's ecological conscience. In their various roles as practitioners, teachers, researchers, advisers, and administrators, foresters seek to sustain and protect a variety of forest uses and attributes, such as aesthetic values, air and water quality, biodiversity, recreation, timber production, and wildlife habitat.

The purpose of this Code of Ethics is to protect and serve society by inspiring, guiding, and governing members in the conduct of their professional lives. Compliance with the code demonstrates members' respect for the land and their commitment to the long-term management of ecosystems, and ensures just and honorable professional and human relationships, mutual confidence and respect, and competent service to society.

On joining the SAF, members assume a special responsibility to the profession and to society by promising to uphold and abide by the following:

## **Principles and Pledges**

- 1. Foresters have a responsibility to manage land for both current and future generations. We pledge to practice and advocate management that will maintain the long-term capacity of the land to provide the variety of materials, uses, and values desired by landowners and society.**
- 2. Society must respect forest landowners' rights and correspondingly, landowners have a land stewardship responsibility to society. We pledge to practice and advocate forest management in accordance with landowner objectives and professional standards, and to advise landowners of the consequences of deviating from such standards.**
- 3. Sound science is the foundation of the forestry profession. We pledge to strive for continuous improvement of our methods and our personal knowledge and skills; to perform only those services for which we are qualified; and in the biological, physical, and social sciences to use the most appropriate data, methods, and technology.**
- 4. Public policy related to forests must be based on both scientific principles and societal values. We pledge to use our knowledge and skills to help formulate sound forest policies and laws; to challenge and correct untrue statements about forestry; and to foster dialogue among foresters, other professionals, landowners, and the public regarding forest policies.**
- 5. Honest and open communication, coupled with respect for information given in confidence, is essential to good service. We pledge to always present, to the best of our ability, accurate and complete information; to indicate on whose behalf any public statements are made; to fully disclose and resolve any existing or potential conflicts of interest; and to keep proprietary information confidential unless the appropriate person authorizes its disclosure.**
- 6. Professional and civic behavior must be based on honesty, fairness, good will, and respect for the law. We pledge to conduct ourselves in a civil and dignified manner; to respect the needs, contributions, and viewpoints of others; and to give due credit to others for their methods, ideas, or assistance.**



## **Important information about online course materials and online course endeavors**

### **Instructor Recording and sharing class lectures**

If a lecture recording only includes the instructor, the recording is not a student record and not considered protected by FERPA. If a recording includes student interactions (questions, presentations, etc.) and those students are identifiable, the recording would be a protected educational record. The recording could only be made available to the students in that specific class and/or to university officials with legitimate educational interest in that information – a genuine need for access to perform their duties. If the instructor wishes to further share the recording outside of the class, either identifiable students would have to provide written consent to release their participation or portions of the recording would have to be changed or omitted to avoid identifying students. But again, if no students are identifiable in any way (seen, heard or named), the recording would not be FERPA protected. Additionally, recordings that include student interactions are appropriate for posting within Canvas.

### **Student Recording and Sharing Class Lecture**

Sometimes students record lectures or copy lecture materials (including instructor's recordings) and post them outside of class on internet sites or provide them to note sharing companies. These acts can violate intellectual property rights held by the instructor and the university. UW System Board of Regent policy authorizes instructors to limit or restrict students from copying, recording or using instructional materials or lectures unless necessary to reasonably accommodate a student's disability. [[Regent Policy Document 4-1](#)] If an instructor wishes to impose restrictions, the instructor should inform students of the limitations and the potential consequences of being subject to charges of student misconduct. Notification can be made through a syllabus, a lecture, or by other means to ensure awareness

*Given the above please note that Lecture/Lab materials and recordings for FOR 321 are protected intellectual property at UW-Stevens Point. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may also take notes solely for their personal use. If a lecture/lab is not already recorded, you are not authorized to record lectures/labs without instructor permission unless you are considered by the university to be a qualified student with a disability requiring accommodation. [Regent Policy Document 4-1] Students may not copy or share lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities. Students are also prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.*

## Lecture Outline

| Week of | Topic(s)   | Readings            | Assigned Work                          |
|---------|--|---------------------|--|
| 9/2     | Introduction, Descriptive Statistics             | Ch. 1; Ch. 3        | Attendance assignment for bonus points |
| 9/7     | Descriptive Statistics, Graphical Description    | Ch. 3; Ch. 2        | none                                   |
| 9/14    | Introduction to Probability, Counting Techniques | Ch. 4               | Problem/Quiz Set                       |
| 9/21    | Discrete Distributions                           | Ch. 5               | none                                   |
| 9/28    | Test 1, Continuous Distributions                 | Ch. 6               | none                                   |
| 10/5    | One Sample Tests of Means and Variation          | Ch. 6; Ch. 8        | none                                   |
| 10/12   | Two Sample Tests of Means and Variation          | Ch. 8; Ch. 9        | none                                   |
| 10/19   | TBD based on class progress                      |                     | Problem/Quiz Set                       |
| 10/26   | Testing Proportions; Confidence Intervals;       | Ch. 8; Ch. 9; Ch. 7 | none                                   |
| 11/2    | Test 2; Confidence Intervals; Correlation        | Ch. 9; Ch. 10       | Problem/Quiz Set                       |
| 11/9    | Regression Analysis                              | Ch. 10              | none                                   |
| 11/16   | Regression Analysis                              | Ch. 10              | Problem/Quiz Set                       |
| 11/23   | Analysis of Variance                             | Ch. 12              | none                                   |
| 11/30   | Analysis of Variance; Test 3                     | Ch. 12              | none                                   |
| 12/7    | Non-Parametric Procedures                        | Ch. 13              | none                                   |
| 12/14   | Comprehensive Final                              |                     |  |

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Laboratory Outline: Note that Monday labs will not meet the first two weeks of the semester. The schedule is adjusted to account for this and no material will be missed.

| Lab Day        | Topic(s)/Applications                 | Assigned Work  |
|----------------|---------------------------------------|----------------|
| 9/3            | Lab introductions with Dr. Gautam     | none           |
| 9/10 or 9/14   | Introduction to Excel® Part I         | none           |
| 9/17 or 9/21   | Introduction to Excel® Part II        | Lab Assignment |
| 9/19 or 9/23   | Probability Lab                       | none           |
| 9/24 or 9/28   | Discrete Distributions; Test 1 Review | Lab Assignment |
| 10/1 or 10/5   | Continuous Distributions              | none           |
| 10/8 or 10/12  | One Sample Tests                      | Lab Assignment |
| 10/15 or 10/19 | Two Sample Tests                      | none           |
| 10/22 or 10/26 | To be determined; Test 2 review       | none           |
| 10/29 or 11/2  | Sampling part I (read Ch 14)          | none           |
| 11/5 or 11/9   | Sampling part II                      | Lab Assignment |
| 11/12 or 11/16 | Regression part I                     | none           |
| 11/19 or 11/23 | Regression Part II/Test 3 review      | Lab Assignment |
| 11/30 or 12/3  | Analysis of Variance part I           | none           |
| 12/7 or 12/10  | Analysis of Variance Part II          | Lab Assignment |

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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.