

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

Fall 2019

<b>INSTRUCTORS:</b>	Dr. Paul Doruska	Dr. Shuva Gautam
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<b>Class Time:</b>	Lectures: Tues., Thurs., Fri.	9:00 am - 9:50 am TNR 464
	Lab Section 1: Mon.	12:00 pm - 1:50 pm TNR 361
	Lab Section 2: Thurs.	3:00 pm - 4:50 pm TNR 360
<b>Final Exam:</b>	Tuesday December 17, 2019	10:15am – 12:15pm TNR 464
<b>Office Hours:</b>	Dr. Doruska Monday 3:00 pm – 3:50 pm, and Thursday 2:00 pm - 2:50 pm	Dr. Gautam Thursday 9-11am
	We are generally available to answer quick questions anytime we are in the office and the door is ajar. Larger, more time-consuming questions require meeting during office hours or an appointment. Questions can be posed via Canvas as well.	
<b>Prerequisite(s):</b>	MATH 95 or MATH 100 or MATH 107 or suitable placement score. May not earn credit in both FOR 321 and MATH 255	
<b>Text:</b>	<i>Elementary Statistics: A Step by Step Approach</i> (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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**Grading:**

There will be three mid-semester exams (each worth 60 POINTS) and an 80 POINT, comprehensive written final exam over the course of the semester. Exam material will include material discussed in lectures, labs, and any assigned readings. Homework and lab assignments (12 in total) will be worth 220 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 homework or lab assignment score will be dropped.

COURSE TOTAL POINTS (after adjustments/drops): 470 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, I 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 the start of class/lab on the respective due dates. Any assignment turned in any time AFTER the start of class/lab 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 and 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 lectures 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 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 lecture class 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.

### **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.

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.

## **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.**

## Excerpts from the Wildlife Society code of Ethics

Section 1. GENERAL PROVISIONS -- All members of the Society must pledge upon application, renewal, or recertification to uphold and conduct their professional and membership-related activities in accordance with the Code of Ethics as prescribed by the Society in the TWS Code of Ethics as prescribed by the Society and set forth in Sections 2 and 3 below. A person accepting membership in the Society incurs the obligation to conduct his or her professional and membership-related activities in a responsible and ethical manner. The Code of Ethics sets forth the required principles of conduct for Society members.

Section 2. GENERAL PROVISIONS -- Members of the Society have a responsibility for contributing to an understanding of human society's proper relationship with natural resources, and in particular for determining the role of wildlife in satisfying human needs and addressing the management of wildlife related impacts. All members of the Society shall adhere to the following principles and practices in the conduct of their professional and membership-related activities.

All members shall:

1. Subscribe to the highest standards of integrity and conduct and will proactively promote and address ethical behavior.
2. Recognize research and scientific management of wildlife species, their environments, and their stakeholders as primary goals.
3. Encourage and sustain the use of sound biological, physical, and social science information in management decisions.
4. Disseminate information to promote understanding of, and appreciation for, values of wildlife and their habitats.
5. Strive to increase the knowledge and skills needed to advance the practice of wildlife management.
6. Promote competence in the field of wildlife management by supporting high standards of education, employment, and performance.
7. Support fair and uniform standards of employment and treatment of those professionally engaged in the practice of wildlife management.
8. Refrain from speaking for or representing the Society or any of its Chapters, Sections, or Working Groups in any way, or implying such representation, without appointment or approval by the Council of the Society, its officers, or the Executive Boards of Chapters, Sections, or Working groups.

Section 3. STANDARDS FOR PROFESSIONAL CONDUCT -- Members of the Society who are employed or otherwise engage in professional activity shall adhere to all provisions of the Code of Ethics, including the following Standards for Professional Conduct. These standards express the intent, practices, and procedures of the Code of Ethics as they particularly apply to wildlife professionals.

Wildlife professionals shall at all times:

1. Uphold the dignity and integrity of the wildlife profession. They shall endeavor to avoid even the suspicion of dishonesty, fraud, deceit, misrepresentation, or unprofessional demeanor.
2. Refrain from plagiarism in verbal or written communications and shall give credit to the works and ideas of others.
3. Refrain from fabrication, falsification, or suppression of results, and shall not deliberately misrepresent research findings, or otherwise commit scientific fraud.

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## Lecture Outline

Week of	Topic(s)	Readings	Assigned Work
9/2	Introduction, Descriptive Statistics	Ch. 1; Ch. 3	Assessment Quest.
9/9	Descriptive Statistics, Graphical Description	Ch. 3; Ch. 2	none
9/16	Introduction to Probability, Counting Techniques	Ch. 4	Handout problems
9/23	Discrete Distributions	Ch. 5	none
9/30	Test 1, Continuous Distributions	Ch. 6	Handout problems
10/7	Continuous Distributions; One Sample Tests of Means and Variation	Ch. 6; Ch. 8	none
10/14	One and Two Sample Tests of Means and Variation	Ch. 8; Ch. 9	Handout Problems
10/21	Two Sample Tests of Means and Variation	Ch. 8; Ch. 9	none
10/28	Testing Proportions; Confidence Intervals;	Ch. 8; Ch. 9; Ch. 7	Handout Problems
11/4	Test 2; Confidence Intervals; Correlation	Ch. 9; Ch. 10	none
11/11	Regression Analysis	Ch. 10	Handout Problems
11/18	Regression Analysis	Ch. 10	none
11/25	Analysis of Variance	Ch. 12	none
12/2	Analysis of Variance; Test 3	Ch. 12	Handout Problems
12/9	Non-Parametric Procedures	Ch. 13	none
12/16	Comprehensive Final 12/17/19 10:15 am		

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## Laboratory Outline

Lab Day	Topic(s)/Applications	Assigned Work
9/5 or 9/9	Introduction to Excel® Part I	none
9/12 or 9/16	Introduction to Excel® Part II	Lab Assignment
9/19 or 9/23	Probability Lab	none
9/26 or 9/30	Discrete Distributions; Test 1 Review	Lab Assignment
10/3 or 10/7	Continuous Distributions	none
10/10 or 10/14	One Sample Tests	Lab Assignment
10/17 or 10/21	Two Sample Tests	none
10/24 or 10/28	To be determined; Test 2 review	none
10/31 or 11/4	Sampling part I (read Ch 14)	none
11/7 or 11/11	Sampling part II	Lab Assignment
11/14 or 11/18	Regression part I	none
11/21 or 11/25	Regression Part II	Lab Assignment
12/2 or 12/5	Analysis of Variance part I; Test 3 Review	none
12/9 or 12/12	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.