

# STAT 705: Probability Theory – Fall 2023

Tu/Th 12:00-1:15pm, AB 206

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**Instructor:** Dr. Deena Schmidt

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**Office Hours:** Wednesday 12-1pm, Thursday 2:30-3:30pm, or by appointment

**Course Website:** WebCampus aka Canvas: [webcampus.unr.edu](http://webcampus.unr.edu)

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- **Course Catalog Description:** This course provides a rigorous foundation in probability theory. Topics include probability axioms, random variables, distributions, moments, moment generating functions, limit theorems, and special topics.
- **Course Prerequisite:** STAT 352 or STAT 461 or STAT 661 or instructor permission
- **Required Textbook:**
  - *Statistical Inference*, 2<sup>nd</sup> edition by George Casella and Roger L. Berger (2002)
- **Additional Optional Textbooks:**
  - *Probability: Theory and Examples*, 5<sup>th</sup> edition by Rick Durrett (2019)
  - *A First Look at Rigorous Probability Theory*, 2<sup>nd</sup> edition by Jeffrey Rosenthal (2006)
- **Course Content:** Casella and Berger book chapters 1-5, and some additional material.
- **Class Procedure:** This course will be delivered in person. Students will be required to access course materials, such as homework assignments, via Canvas. The course schedule will be posted on Canvas and updated weekly. I will announce upcoming assignments/exams at the beginning of each lecture, but it is your responsibility to check the schedule each week.
- **Student Learning Outcomes:** Upon completion of this course, students will be able to:
  - Work with univariate and multivariate distributions.
  - Compute moments of random variables.
  - Derive and prove limit theorems.

## COURSE REQUIREMENTS:

- **Homework:** Homework will be assigned weekly (most weeks) and will be due on the listed due date. Submission can either be done online via Canvas or turned in (paper copy) during class or office hours by 5pm on the due date. A subset of the assigned problems will be graded. Please write legibly or type using LaTeX / R Markdown. Your solutions must show all relevant work and be a clear explanation of your reasoning. The same applies to exams. In addition to assigned homework, I expect students to read the relevant sections in the book.
- **Exams:** There will be two midterm exams and a comprehensive final exam. See the tentative course schedule at the end of the syllabus for more details.
- **Final Exam:** Thursday December 14, 2023 at 10:15am-12:15pm
- **Grading Scale:** Your grade for the course will be calculated as:

Homework: 40%		Midterm Exams: 40%		Final Exam: 20%	
A	93.0 – 100%	C	73.0 – 76.9%		
A-	90.0 – 92.9%	C-	70.0 – 72.9%		
B+	87.0 – 89.9%	D+	67.0 – 69.9%		
B	83.0 – 86.9%	D	63.0 – 66.9%		
B-	80.0 – 82.9%	D-	60.0 – 62.9%		
C+	77.0 – 79.9%	F	0 – 59.9%		

## Topics Outline:

- C&B Chapter 1: Probability Review
- C&B Chapter 2: Transformations and Expectations
- C&B Chapter 3: Common Families of Distributions
- C&B Chapter 4: Multiple Random Variables
- C&B Chapter 5: Properties of a Random Sample
- Additional material if time allows

**Make-up/Late Policy:** Late homework may be turned in late to be graded on completion for a penalty. There will be no early or makeup exams, unless there is a compelling reason (medical/family emergency, university approved activity, religious holiday). Students participating in official university activities that interfere with exams must make arrangements with the instructor at least two weeks prior to the exam in question. UNR policies are provided in [UAM 3,020](#) and at <https://med.unr.edu/shc/insurance/clinic-policies>. Any student requiring accommodations through the DRC must schedule their exams on the same day as the in-class exam.

**Attendance:** Students are strongly encouraged to attend all classes.

**Etiquette:** Please be considerate of your fellow students and instructor. Please turn off all extraneous electronics (those not being used for class) before class. Behavior that may disrupt the learning environment will not be tolerated. To clarify what counts as disruptive, please ask the instructor and see the definition given in the University Academic Standard policy: [UAM 6,502](#).

## **UNIVERSITY POLICIES:**

### **Academic Dishonesty**

The University Academic Standards Policy defines academic dishonesty, and mandates specific sanctions for violations. See the University Academic Standards policy: [UAM 6,502](#).

### **Student Compliance with University Policies**

In accordance with section 6,502 of the University Administrative Manual, a student may receive academic and disciplinary sanctions for failure to comply with policy, including this syllabus, for failure to comply with the directions of a University Official, for disruptive behavior in the classroom, or any other prohibited action. "Disruptive behavior" is defined in part as behavior, including but not limited to failure to follow course, laboratory or safety rules, or endangering the health of others. A student may be dropped from class at any time for misconduct or disruptive behavior in the classroom upon recommendation of the instructor and with approval of the college dean. A student may also receive disciplinary sanctions through the Office of Student Conduct for misconduct or disruptive behavior, including endangering the health of others, in the classroom. The student shall not receive a refund for course fees or tuition.

### **Audio and Video Recording**

#### **Student-created Recordings**

Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.

#### **Instructor-created Recordings (if we have any online sessions)**

Class sessions may be audio-visually recorded for students in the class to review and for enrolled students who are unable to attend live to view. Students who participate with their camera on or who use a profile image are consenting to have their video or image recorded. If you do not consent to have your profile or video image recorded, keep your camera off and do not use a profile image. Students who un-mute during class and participate orally are consenting to have their voices recorded. If you do not consent to have your voice recorded during class, keep your mute button activated and only communicate by using the "chat" feature, which allows you to type questions and comments live.

## **CAMPUS RESOURCES:**

### **Disability Services**

Any student with a disability needing academic adjustments or accommodations is requested to speak with me or the [Disability Resource Center](#) (Pennington Achievement Center Suite 230) as soon as possible to arrange for appropriate accommodations.

This course may leverage 3<sup>rd</sup> party web/multimedia content, if you experience any issues accessing this content, please notify your instructor.

### **Maintaining a Safe Learning and Work Environment**

The University of Nevada, Reno is committed to providing a safe learning and work environment for all. If you believe you have experienced discrimination, sexual harassment, sexual assault, domestic/dating violence, or stalking, whether on or off campus, or need information related to immigration concerns, please contact the University's Equal Opportunity & Title IX office at 775-784-1547. Resources and interim measures are available to assist you. For more information, please visit the [Equal Opportunity and Title IX](#) page.

### **Campus Closures or Delays**

In the event of class cancelations or delays caused by inclement weather conditions, fire/smoke conditions, or other unforeseen emergencies, the safety and well-being of students are the University's top priority. Official notifications will be disseminated through the University website and other official channels with details related to any campus delays or closures.

In the event of a campus closure, you will be informed as to whether the class will be offered remotely or if it will be canceled. If the class is cancelled, you will receive information on how to address any missed course content.

Students facing significant impacts due to these events are encouraged to communicate with their instructor for potential accommodations.

### **COVID-19 or Other Illness**

If you are sick, please do not come to class. If you must miss class due to illness, please contact your instructor immediately to make arrangements for any missed work or lecture materials. If you are coughing but not sick enough to stay home, please wear a mask during class!