Probability Theory (MATH 441/661) Course Syllabus

Instructor: Paul J. Hurtado (`phurtado@unr.edu`) **Spring 2015**
Office: 220 DMSC. Phone: 775-784-4655 or Math Office: 775-784-6773
Text: Larsen & Marx *An Introduction to Mathematical Statistics & Its Applications* (5th)
Lectures: TR 9:30am-10:45am in **Room SLH 3**.
Office Hours: TW 1-2pm, or by appointment, in 220DMSC. (These times may change)

Catalog Description: Probability space axioms; random variables, expectation, univariant and multivariant distribution theory, sequences of random variables, Tchebychev inequality, law of large numbers, and central limit theorem. (Formerly MATH 451/651; implemented Fall 2003.)

Course Pre/Co-requisites, Recommended Preparation: Math 285.

Course Website: Registered students are responsible for frequently checking their MyNevada email accounts, as well as the course website at `http://www.pauljhurtado.com/SP15/`. All students taking this class are assumed to be aware of all information posted on the course website.

Course Objectives: The objective for this course is to learn the theory, methods and terminology of probability theory, and to be able to apply and communicate them in practice.

Course content: Book chapters 1-4, and some additional material.

Student Learning Outcomes: Upon successful completion of Math 461/661, a student will be able to: Recognize the role of probability theory in the sciences; communicate ideas and results of probability; define, and apply the concepts of sample space, events, probability, random variables and their distributions, joint probability distributions, expectation, variance and covariance of random variables; formulate and apply theorems concerning functions of random variables and moment-generating functions, Chebyshev's theorem, the Central Limit Theorem and Law of Large Numbers. Those enrolled in Math 661 will also be able to formulate and apply the definitions of convergence in distribution and in probability, formulate scientific problems involving randomness in mathematical terms.

General Rules: I come to class to teach, and I assume you will come to class to learn and to help one another learn. Everyone in class, myself included, is expected to be respectful to one another. All of your electronic devices (phones, laptops, music players, etc.) are to be turned off while in the classroom, unless approved by the instructor. Disruptions during class will not be well tolerated, and are to be kept to a minimum.

Graduate/Undergraduate: All homeworks and exams may differ for graduate (661) and undergraduate (461) students.

Homework: Homework will be assigned approximately once per week, and will be due Thursdays at the start of class. A subset of the assigned problems will be graded. Please write legibly or type solutions on one side of the page only. I will give zero credit for problems I cannot easily read. Your solutions must show all relevant work, and be a clear explanation of your reasoning. The same applies to exams.

Computing Resources: Some homeworks may require use of mathematical or statistical software. Students are assumed to have access to a computer with the free software R (www.r-project.org) or similar software (such as SAS) installed. Students installing R on a personal computer are further encouraged to use the front-end RStudio (www.rstudio.com).

Exams: There will be two in class (midterm) exams and a comprehensive final. Dates are TBA. The final exam will be comprehensive and will emphasize material not emphasized in the midterms. **The final exam is scheduled for 12:30-2:30pm on Tuesday, 12 May 2015**.

Prior the Final Exam, a *pre-final score* will be calculated that is 20% Homework, 80% Midterm Exams. Near the end of the term, you will be given this pre-final score in class, along with the opportunity to opt out of the final exam and accept your pre-final score as their final grade for this course. The date of this class will be announced in class and on the course website later in the semester. This will be a one-time opportunity. You must be present in class that day to sign an appropriate document in order to take this opportunity to opt out of the final. You may not take the final and then request to use your pre-final score.

If you decide to take the final, your grade for the course will be determined after the final as follows:
20% Homework   50% Midterm Exams   30% Final Exam

The grading scale that will be used is: A ($\geq$90%), A- ($\geq$87%), B+ ($\geq$85%), B ($\geq$80%), B- ($\geq$77%), C+ ($\geq$75%), C ($\geq$70%), C- ($\geq$67%), D ($\geq$60%), D- ($\geq$57%), F ($<$57%).

Makeup, Late Policy: Late homework will not be graded. There will be no early or make-up exams. If you miss an exam for a valid reason your final exam will be weighted accordingly (ex: missing one midterm would shift the final score to 20% Homework, 25% Midterm Exam, 55% Final Exam). There will be no make-up or early final exam. 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.

Academic Dishonesty: "Cheating, plagiarism or otherwise obtaining grades under false pretenses" constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student's enrollment without a grade, giving an F for the course or for the assignment. For more details, see the UNR General Catalog.

Disability Services: Any student with a disability needing academic adjustments or accommodations is requested to speak with the Disability Resource Center (Thompson Building, Suite 101) and then me, as soon as possible, to arrange for appropriate accommodations.

Academic Success Services: A common habit among successful students is to seek help outside of the classroom. Your student fees cover usage of the Math Center (784-4433 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring-center), and University Writing Center (784-6030 or http://www.unr.edu/writing-center). These centers support your classroom learning; it is your responsibility to take advantage of their services."

Statement on Audio and Video Recording: 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 allowed to record class lectures and discussions. Therefore, your comments and actions during class may be recorded. Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy.