MA 421 Syllabus   Summer I 2019   B. Burns-Williams

Description: MA 421 is a one-semester course in probability for math majors and students in other majors who want to learn the basic theory of probability as well as some applications of probability.

Text: *A First Course in Probability* (8th edition) by Sheldon Ross. ISBN: 978-0-13-603313-4

Schedule:

We will cover the first seven chapters although some sections or parts of sections may be omitted. If time permits we will do some of the sections in chapters 8 and/or 9.

Chapter 1: Basic Principles of Counting, Permutations, combinations, Multinomial Coefficients
Chapter 2: Sample Spaces and Events, Axioms of Probability, Simple Propositions, Sample Spaces having equally likely outcomes, Probability as a continuous Set function
Chapter 3: Conditional Probabilities, Bayes's Formula, Independent Events
Chapter 4: Random Variables, Discrete Random Variables, Expected Value, Expectation of a function of Random Variables, Variance, The Bernoulli and Binomial Random Variables, The Poisson Random Variable, Discrete Probability Distributions, Expected Value of Sums of Random Variables, Properties of Cumulative Distribution Functions
Chapter 5: Continuous Random Variables, Expectation and Variance of CRV, Uniform Random Variable, Normal Random Variables, Exponential Random Variables, Other Continuous Distributions, Distribution of a function of a Random Variable.
Chapter 6: Joint Distribution Functions, Independent Random Variables, Sums of Independent Random Variables, Condition Distributions (Discrete and Continuous cases), Joint Probability Distribution of functions of Random Variables,
Chapter 7: Expectation of Sums of Random Variable , Moments of the Number of Events that Occur, Covariance, Variance or Sums and Correlations, Conditional Expectation and prediction
Chapter 8/9 (as time permits): Chebyshev's Inequality and the Weak Law of Large Numbers, The Central Limit Theorem, The Strong Law of Large Numbers, Markov Chains

Grading:
There will be 3 one-hour exams with the first one probably coming when we complete chapter 3, the second after we complete chapter 5 and the third after chapter 7. That schedule depends on the rate at which the class progresses so it is subject to change.

The final exam is on June 19, 2019 from 1 pm – 4 pm.

There will be 8-10 turn-in homework assignments due about every couple of days. In addition, practice problems will be assigned every class day. In general, test problems will be much more similar to the practice problems than to the turn-in problems, since the turn-in problems are ones that are important to be able to do, but generally take more thought and time than is practical for exam questions.

 Grading policy: Each hour exam is worth 18%, homework counts 18% and the final exam counts 28%. You are expected to attend all classes on time. If you have to miss an exam for reasons of illness or some other excused absence, please contact me prior to the exam so we can arrange for a makeup. Incomplete grades will be handled on an individual basis.

Accommodations: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515 7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (REG02.20.1).   If you have a disability, please schedule an appointment with me so we can discuss accommodations that should be made.

Academic Integrity:
It is my understanding and expectation that your signature on any exam or assignment means that you have neither given nor received any unauthorized aid. Students may discuss assignments with other students in this section of the class and with me, but no other persons. Students are expected to write up their assignments individually. Homework assignments will be due at the beginning of class on the day due. No late homework will be accepted.

Contact Information: Office: SAS 3241
Office Hours: 1:15 – 1:45 pm MTWH or by appointment
Office Phone: 513-2114
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