Washington University - St. Louis
Spring 2021
Math 493 - Probability
Lecture: Remote   Time: MWF 2:00pm – 2:50pm

Instructor: Brett D. Wick   Office: Cupples I Room 212
Office Phone: 314-935-6765   Office Hours: MWF 1:00pm – 2:00pm
Email: wick@math.wustl.edu   or by appointment
Webpage: http://www.math.wustl.edu/∼wick/teaching/math493_S2021.html

Text: The following text is required for the course:

   Title: "A First Course in Probability"

   Authors: Sheldon Ross

   Edition: 9th

Prerequisite and Description: Mathematical theory and application of probability at the advanced undergraduate level; a calculus based introduction to probability theory. Topics include the computational basics of probability theory, combinatorial methods, conditional probability including Bayes' theorem, random variables and distributions, expectations and moments, the classical distributions, and the central limit theorem. Prerequisites: Math 233 and Math 3200.

Attendance: Attendance is required for all lectures. The student who misses a class meeting is responsible for any assignments and/or announcements made. Office hours will not be utilized to re-teach material presented in class. However, questions to better understand the course are always welcome.

There will be no opportunities for make-up tests after the fact. **In the event of an absence due to travel representing Washington University - St. Louis, such as an intercollegiate sports competition, you must notify the professor at least two weeks in advance to arrange an early test or other alternative**. Otherwise, such absences will be treated as personal. In the event of a missed exam, contact Blake Thornton: bthornton@wustl.edu.

Homework: This course will have weekly homework assignments which will be graded.

Exams: This course will have three mid-term exams and a comprehensive final exam. The exam dates for the course will take place on:

Exam Dates:

Exam 1	Wednesday, February 24 (tentative)
Exam 2	Wednesday, March 31 (tentative)
Exam 3	Friday, April 30 (tentative)
Final Exam	Tuesday, May 11, 3:30pm – 5:30pm

Exam Re-Grading Policy:. If you disagree with the grading of your exam you are to notify me of the issue at the time of return. If you take the exam when it is returned to you without registering a complaint regarding the grading, then your score is set and no additional regrades will be considered for that exam. If you request a regrading of your exam, you may additionally arrange a meeting to discuss the regrading issue with me directly.

Learning Disabilities: It is the right of any student with a certified learning disability to request necessary accommodation. Such requests must be made well in advance of the time that the accommodation is required and a letter of documentation from the Disability Resources office must be presented at the time of any request.

Academic Honesty: It is expected that all students are aware of their individual responsibilities under the WUSTL Academic Integrity Policy, which will be strictly adhered to in this class. **Any violations must be reported directly to the Dean of Students.**

Grades: Grades will be based upon attendance, worksheets, homework's, mid-term exams, and the final exam. Course grades will be assigned from the *maximum* of the following formulas:

	Method 1	Method 2
Homework	20%	20%
Midterm Exams	45%	35%
Final Exam	35%	45%

The usual ten-point scale will be used (A: 90-100, B: 80-89, C: 70-79, D: 60-69, F: 0-59), however, if necessary, adjustments will be made to arrive at a standard grade distribution for the course. On an individual basis, significant improvement over the semester will be taken into account. A to be announced number of homework will be dropped when computing your grade. This is the only mechanism for coping with personal events such as illness and family emergencies. For students taking the course with the Pass/Fail option, the threshold for a passing grade will be a "C".

Policy Regarding Online Course: Since the course currently meets remotely, in the event the course needs to transition to completely online there will be minimal changes to the course.

COVID Safety Procedures: Students are expected to follow university-mandated COVID safety procedures at all times, and stay informed of any changes to these procedures. Failure to do so will result in you being removed from the classroom, and possible university disciplinary procedures. Masks and social distancing are the most important safety measures we can take; it is also important that you wash your hands and clean surfaces as frequently as possible.

Masks are mandatory at all times in the classroom; if you have a medical condition that precludes wearing one, contact Disability Resources to discuss accommodations before coming to class.

If you are sick: If you are sick, quarantined, or do not pass WUSTL self-screening, do not come to class in person. Notify your instructor and the assistant to the instructor.

If your instructor is sick: If your instructor is sick, quarantined, or does not pass self-screening, your class meeting may need to move online for the day. Please check Canvas (or your email) immediately before you leave for class in case your meeting needs to move online at the last minute.

Important Dates for Spring 2021:

January 25	First day of classes
February 9	Wellness Day - No Class
March 2, 3, 22	Wellness Day - No Class
May 4	Last day of classes
May 5-6	Reading days
May 7-13	Final Exams

Approximate/Tentative Course Outline:
Week 1: Probability Axioms, basic examples and properties (Sections 2.1-2.5)
Week 2: Conditional Probability and Bayes's Rule (Sections 3.1-3.3)
Week 3: Independence, Random Variables and Expected Values (Sections 3.4, 4.1-4.3)
Week 4: Functions of a Random Variable, Variance, and Binomial Distribution (Sections 4.4-4.6)
Week 5: Poisson Distribution and Other Discrete Distributions (Sections 4.7-4.8)
Week 6: Continuous Random Variables: Basic Concepts, Expectation and Variance (Sections 5.1-5.2)
Week 7: Some Special Continuous Distributions (Sections 5.3-5.6)
Week 8: Jointly Distributed Random Variables, Indepedence and Sums of Random Variables (Sections 6.1-6.3)
Week 9: Conditional Distributions and Conditional Expectations (Sections 6.4-6.5, 7.5-7.6)
Week 10: Moment Generating Functions and Multivariate Normal Distributions (Sections 7.1-7.8)
Week 11: t and F distributions (Notes)
Week 12: Consistency and Weak Law of Large Numbers (Sections 8.1-8.2)
Week 13: Strong Law of Large Numbers and Central Limit Theorem (Sections 8.3-8.4)