Math 3338—Probability

Fall Semester 2016

The Course

Text: "A First Course in Probability," ninth edition, by Sheldon Ross, published by Pearson.

Time and Place: Tueday, Thursday, 2:30 pm – 4:00 pm in 201 SEC.

Instructor: Professor David H. Wagner

Email: wagner@math.uh.edu

Website: https://www.math.uh.edu/~wagner/3338/3338_Fall_2016.html

Office Hours: Tuesday, Thursday 1:10 – 2:00 pm.

Prerequisites: Math 1432 (Calculus II).

Final exam date : In class, Thursday, Dec 7, 2-5 pm.

Last day to drop the class and get a full refund, and to have the hours not count towards the Enrollment Cap for Texas Residents : Wednesday, Sept. 7.

Last day to drop a class or withdraw: Friday, October 28

Welcome to the wonderful world of probability and statistics! This is a first course in these topics so that you do not need any prior knowledge in these areas (You just need Calculus II. Some knowledge of double integrals would help, but we will review this briefly). We will try to present everything in a self-contained way, but it might be very helpful to you to refresh your memory from Algebra and Calculus (eg. derivatives, integrals, infinite series).

Topics to be covered:

Ch. 1 Combinatorial Analysis
- 1.2 The basic principle of counting
- 1.3 Permutations
- 1.4 Combinations
- 1.5 Multinomial coefficients

Ch. 2 Axioms of Probability
- 2.2 Sample Space and Events
- 2.3 Axioms of Probability
- 2.4 Some simple propositions
- 2.5 Sample spaces having equally likely outcomes
- 2.6 Probability as a measure of belief

Ch. 3 Conditional Probability and Independence
- 3.2 Conditional probabilities
- 3.3 Bayes' formula
- 3.4 Independent events
- 3.5 P(·|F) is a probability

Ch. 4 Random variables
- 4.1 Random variables
- 4.2 Discrete random variables
- 4.3 Expected value
- 4.4 Expected value of a function of a random variable
- 4.5 Variance
- 4.6 Bernoulli and binomial random variables
- 4.7 Poisson random variables
- 4.8 Other discrete distributions
  - Geometric, Negative Binomial, Hypergeometric, Zeta distributions
- 4.9 Expected value of sums of random variables
- 4.10 Properties of the cumulative distribution function

Ch. 5 Continuous random variables
- 5.2 Expected value and variance of continuous rand variables
- 5.3 Uniform random variables
- 5.4 Normal random variables
- 5.5 Exponential random variables
- 5.6 Other continuous distributions
- 5.7 The distribution of a function of a random variable

We cover sample spaces, events, probabilities, Bayes Theorem, random variables and their distributions, expectations, variance and covariance, basic discrete and continuous distributions, and much more. The complete syllabus is described on a separate handout. Please always bring the textbook to class, since many examples contain sample data that is not practical to write entirely on the board. I suggest using it for reading ahead, or for more explanations or proofs.

COURSE GRADES: the course grade consists of:

Quizzes and Homework	100 points
3 Tests (100 points each)	300 points
Final Exam	200 points

The instructor may change this at his/her discretion if doing so will benefit the class as a whole.

TESTS AND FINAL EXAM: The tests and final exam will be based on the notes given in class, and on the homework. There are NO makeup exams. If you miss an exam (for an excused or unexcused reason) you will receive a zero. The final exam score, for each student, will replace the lowest exam grade.

HOMEWORK: Homework will be given in class almost daily. It will not be collected after it is assigned. There is a list of suggested exercises on the syllabus which you are encouraged to do. They are there to help you learn and internalize the material and it will not be collected. You are encouraged to work with others, form study groups, and so on. However you should not simply copy homework.

QUIZZES: There will be quizzes in class occasionally. They will be announced at least the day before. They will cover homework assignments and/or notes.

INCOMPLETES: only given to students with at least a C average who are unable to take the Final for unforeseeable, unpreventable, documented circumstances.

TUTORING/HELP: Your grader and I have office hours. There are free tutoring services in Mathlab (CASA, located in 222 Garrison. MathLab has student tutors who, on a walk-in basis, offer help with individual problems.) You have already paid for this through your fees so use it if you need it.

Tentative *Calendar*

M	6/6	2.1, 2.2	
Tu	6/7	2.3	
W	6/8	3.1, Combinatorics	
Th	6/9	3.2, 3.3	Quiz #1
F	6/10	3.4, Review	Quiz #2
M	6/13	**Test #1**, Integration	
Tu	6/14	4.1.1-4.1.5	
W	6/15	4.1.6-4.1.8	Quiz #3
Th	6/16	4.1.9-4.1.12	
F	6/17	4.2.1-4.2.2	Quiz #4
M	6/20	4.2.3, 4.3.1, 4.3.2	
Tu	6/21	Review	Quiz #5
W	6/22	**Test #2**, Start Ch 5	
Th	6/23	5.1, 5.2	
F	6/24	5.3, 5.4	Quiz #6
M	6/27	6.1, 6.2	
Tu	6/28	6.3, 8.1	
W	6/29	8.2, 8.3, 8.5	Quiz #7
Th	6/30	Review	Quiz #8
F	7/1	**Test #3** (Tentative)	
Tu	7/5	Review for Final	
Th	7/7	**Final Exam, 2-5pm**	