

MA 320-001 Spring 2018

Introductory Probability

Instructor

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Office hours: Monday and Wednesday 4:30-5:30 pm, Friday 3-4 pm, or by appointment

Textbook

Introduction to Probability (second edition), by Charles M. Grinstead and J. Laurie Snell.

The book can be purchased from the [UK Bookstore](#) and also freely available [here](#).

We will cover chapters 1 through 9 of the textbook. This includes determination of probabilities, combinatorial analysis, conditional probability and independence, discrete and continuous random variables and their distributions, expectation and variance, the strong law of large numbers and the central limit theorem.

The [Textbook's Website](#) has other interesting materials that help illustrate ideas and concepts in probability theory, such as programs that you can use to simulate experiments in probability.

Prerequisite

The official prerequisite for the course is MA 213, or an equivalent multi-variable calculus course.

Grading

Your grade in the course will be based on the following.

- **20% Quizzes**
- **20% Homework**
- **40% Midterm exams**
- **20% Final exam**

Quizzes: There will be 6 in-class quizzes. The lowest quiz score will be dropped.

Homework: This portion of your grade will be earned by completing individual online assignments outside of class. These assignments are available at

<https://webwork.as.uky.edu/webwork2/MA320-Zhou-S18/>

Homework is usually assigned every week, and typically will be due three to five days after it is assigned. There will be a homework assignment whose due date is during Dead Week.

Midterm exams: We will have two midterm exams. Both exams will count towards your grade. Each exam will be cumulative, although for the second midterm, emphasis may be given to material covered after the first midterm.

Final exam: The final exam is cumulative, although it may emphasize material covered after the second midterm.

Problem solutions on exams and quizzes will be graded according to the quality of the solution and not just the correctness of the answer.

Letter grades will be assigned by the standard scale scale:

90 – 100% = A; 80 – 89% = B; 70 – 79% = C; 60 – 69% = D; Below 60% = E

Exam Dates (tentative!)

- Midterm 1 (in class): during the week of Feb 12-16.
- Midterm 2 (in class): during the week of March 26-30.
- Final exam: According to the Registrar.

No make-up exam will be given except in the case of an excused absences on the day of the exam. Senate Rules 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor. Students may be asked to verify their absences in order for them to be considered excused.

Course Outline

- Chapter 1: Discrete Probability Distributions
Simulation of Discrete Probabilities.
Discrete Probability Distributions.
- Chapter 2: Continuous Probability Densities
Simulation of Continuous Probabilities.
Continuous Density Functions.
- Chapter 3: Combinatorics
Permutations.
Combinations.
- Chapter 4: Conditional Probability
Discrete Conditional Probability.
Continuous Conditional Probability.
Paradoxes.
- Chapter 5: Distributions and Densities
Important Distributions.
Important Densities.
- Chapter 6: Expected Value and Variance
Expected Value.
Variance of Discrete Random Variables.
Continuous Random Variables.
- Chapter 7: Sums of Random Variables
Sums of Discrete Random Variables.
Sums of Continuous Random Variables.
- Chapter 8: Law of Large Numbers
Discrete Random Variables.
Continuous Random Variables.
- Chapter 9: Central Limit Theorem
Bernoulli Trials.
Discrete Independent Trials.
Continuous Independent Trials.