MATH-UA-233-007 Theory of Probability

Spring 2021 Matan Leibovich Tues., Thurs., 12:30pm-1:45pm

ONLINE by Zoom

Course Description

An introduction to the mathematical treatment of random phenomena occurring in the natural, physical, and social sciences. Axioms of mathematical probability, combinatorial analysis, binomial distribution, Poisson and normal approximation, random variables and probability distributions, generating functions, Markov chains applications.

Prerequisites: MATH-UA 123 Calculus III or MATH-UA 213 Math for Economics III (for Economics majors) with a grade of C or better and/or the equivalent, and MATH-UA 140 with a grade of C or better and/or the equivalent. Not open to students who have taken MATH-UA 235 Probability and Statistics

Teaching Staff

Instructor
Matan Leibovich
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Office Hours: Tues., Thurs., 2pm-3pm

Teaching Assistant
Boyi Li
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Recitations:Fri 9:30-10:45 am
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Textbook

A First Course in Probability, by Sheldon Ross, 10th edition. The course follows the book closely and many of the homework assignments will be taken from it.

The books by DeGroot and Schervish and Blitzstein do a good job of covering the course material. DeGroot's book also covers statistics.

Prof. Joseph Blitzstein has a great collection of video lectures online at Harvard Stat 110 that cover the same material we will.

Homework assignments

: Homework will be posted on Thursday every week (starting from week 2) and will be based on that week's lectures. You are required submit the homework via Gradescope.

Midterms and Final

: there will be two midterms, and a final. The midterms will take place during class hours. The exams will be time limited (between. We will try our best to accommodate, but ideally everyone will take the exams at the same time.

Communication

The syllabus, calendar, worksheets, homework problem sets, solutions and any updates/announcements for this course will be communicated in class, by email and/or posted to NYU Classes. We will also be using an online QA forum called Campuswire. Mathematical questions should be asked on Campuswire, which can be done anonymously or using your full name. To join Campuswire: ...

Grade makeup

- Homework - 10%
- Each midterm - 25%
- Final - 40 %

Class Schedule (tentative)

Week	Tuesday	Thursday
1		**1/28** 1.1-1.5
2	**2/2** 1.5 2.3	**2/4** 2.4-2.5
3	**2/9** 2.5, 3.1-3.2	**2/11** 3.2-3.3
4	**2/16** 3.3-3.4	**2/18** 3.4
5	**2/23** 3.5, 4.1	**2/25** 4.2-3.4, 4.9
6	**3/2** 4.4-4.5	**3/4 Midterm 1**
7	**3/9** 4.6	**3/11** 4.7-4.8.1
8	**3/16** 4.8	**3/18** 5.1-5.2
9	**3/23** 5.2-3	**3/25** 5.5,5.4
10	**3/29** 5.4	**4/1** 6.1
11	**4/6** Revision	**4/8 Midterm 2**
12	**4/13** 6.2	**4/15** 6.3
13	**4/20** 6.4-6.6	**4/22** 6.6
14	**4/27** 6.7,7.2,7.4	**4/29** 7.4-7.5
15	**5/4** 8.2-8.3	**5/6** Review & supplementary material

article [utf8]inputenc hyperref array [table]xcolor MATH-UA-233-007 Theory of Probability, Homework 1 Due February 12, 10 PM EST on Gradesope Answer the following questions from the textbook. Numbers are for 10th edition. 8th edition numbers (if there is a discrepancy) are in parentheses.

1. 1.7
2. 1.10
3. 1.21 (1.19)
4. 1.31 (1.28)
5. 1.32 (1.29)
6. 1.33 (30)
7. 1.T.8
8. 1.T.12 (a)
9. 2.2
10. 2.5
11. 2.T.2

Read $x.y$ as problem number y in chapter x, and $x.T.y$ as theoretical exercise number y in chapter x.