

MATH-UA.0235 - Probability and Statistics

Fall 2021

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Book: *A Modern Introduction to Probability and Statistics: Understanding Why and How*
by Dekking, Kraaikamp, Lopuhaä, and Meester
An electronic version is freely available on NYU Bobcat

Structure: This is a hybrid class. There is a lecture Monday and Wednesday 11:00am-12:15pm on Zoom. There is an in-person recitation on Friday (either at 8am or 11am). Students are expected to attend lectures and **the recitation they are registered for** at the appointed times.

Schedule: (*Tentative*)

Week	Dates	Topics	Exams
1	9/8	Spaces, events, outcomes	
2	9/13-15	Combinatorics, conditional probability, independence	
3	9/20-22	Discrete random variables	
4	9/27-29	Continuous random variables	
5	10/4-6	Expectation, variance, moments	
6	10/11-13	Computation with random variables	Exam 1, Oct 13th
7	10/18-20	Joint distributions, covariance, correlation	
8	10/25-27	Poisson process	
9	11/1-3	The law of large numbers	
10	11/8-10	Statistical models, samples	
11	11/15-17	Estimation of parameters	Exam 2, Nov 17th
12	11/22-24	MLE, Cramer-Rao inequality, conditional distributions	
13	11/29-12/1	Least squares, regression, confidence intervals	
14	12/6-8	Hypothesis testing	
15	12/13	Review	Final, TBD

Exams: There will be two mid-term exams and a Final exam. The midterms will take place during class on Oct 13th and Nov 17th. The Final exam will take place during finals week, time TBD. Exams will be administered on Gradescope.

Work and Grading: All work should be turned in on time; late work will not be accepted save for religious events, verifiable illness, military service, or extreme circumstance.

- *Written Homework* will be weekly and due on Mondays. They will be submitted and graded by a grader on Gradescope. The lowest homework grade will be dropped.
- *Quizzes* will be short, weekly, and administered during recitation. There are no make-ups for quizzes. The lowest 4 will be dropped to account for this.
- *Exams* will be taken on Gradescope. They will be timed exams that take place during class time.

Final Grade:

25% Homework, 5% Quiz, 20% Exam 1, 20% Exam 2, 30% Final

Technology

- *NYU Brightspace* will be used to coordinate the course, Zoom, class notes, and grades. Class will be recorded and a pdf of written notes made available.
- *Gradescope* will be used for written work and exams. You will have to upload PDFs correctly. Cam-Scanner is a free app that has worked well in the past. Do not upload other formats, and make sure that your files are correctly oriented and labeled. Failure to do so may result in a penalty.