MATH-UA.0235 - Probability and Statistics

Fall 2022

Lecturer: Qi Lei
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Recitation: Elias Hess-Childs
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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 an in-person class. There is a lecture Monday and Wednesday 11:00am-12:15pm at CIWW 101. There is a recitation on Friday (either at 9:30 am or 12:30 pm). Students are expected to attend lectures and **the recitation they are registered for** at the appointed times.

Schedule: *(Tentative)*

Week	Dates	Topics	Exams
1	9/7	Spaces, events, outcomes	
2	9/12-14	Combinatorics, conditional probability, independence	
3	9/19-21	Discrete random variables	
4	9/26-28	Continuous random variables	
5	10/3-5	Expectation, variance, moments	
6	10/12	Computation with random variables	**Exam 1, Oct 12$^{\text{th}}$**
7	10/17-19	Joint distributions, covariance, correlation	
8	10/24-26	Poisson process	
9	10/31-2	The law of large numbers	
10	11/7-9	Statistical models, samples	
11	11/14-16	Estimation of parameters	**Exam 2, Nov 16$^{\text{th}}$**
12	11/21-28	MLE, Cramer-Rao inequality, conditional distributions	Fall break
13	11/30-12/05	Least squares, regression, confidence intervals	
14	12/07-12	Hypothesis testing	
15	12/14	Review	**Final, TBD**

Exams: There will be two mid-term exams and a Final exam. The midterms will take place during class on Oct 12$^{\text{th}}$ and Nov 16$^{\text{th}}$. 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.
- *Quizzes* will be short, weekly, and administered during recitation. There are no make-ups for quizzes.
- *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. A pdf of written notes will be made available.
- *Gradescope* will be used for written work and exams. You will have to upload PDFs correctly. CamScanner 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.

Diversity Statement

- As an instructor, I will strive to create a safe, respectful, and inclusive environment for all students regardless of their identity. I recognize and value diversity inside and outside of the classroom, and recognize that each student has a unique contribution to make and brings with them different strengths and weaknesses. I welcome your ideas for how to promote a better understanding and deeper learning in this class as a community. Please feel free to ask questions, to participate in discussions, and to suggest new approaches to the class content. Please also feel welcome to raise any issue you may have in class or outside of class, including reporting incidents of bias or discrimination, whether intentional or unintentional, either to me, to your advisor(s)/mentor(s), or by using the NYU Bias Response Line.