Mathematics 3501 (old number: 51.1; Probability and Statistics I), Spring 2021 Section ETY6; Code 13983 Tuesday, Thursday 06:05-07:45pm Classroom: online Instructor: Attila Máté

Office. Classes are online, so the office listed is inaccessible for now; the office phone is not answered. IH-1149b, 718-951-5000/2734, IH-1156 (the main Mathematics Department Office) 718-951-5246.

Office Hours. You may contact me home at reasonable hours. No fixed office hours as long as classes are online.

Textbook. Sheldon Ross, A First Course in Probaility, Tenth Edition, Pearson, 2019. ISBN-13: 9780134753683

Publisher's Web site.

https://www.pearson.com/us/

Publisher's Web site for the book.

https://www.pearson.com/us/higher-education/program/ Ross-First-Course-in-Probability-A-10th-Edition/PGM1786065.html

Exams. Class exams count 60%, the final exam counts 40% in the course grade. For online teaching, 6 to 8 exams are planned at the second half of the class some meetings. This might change as I will need to assess the needs for online teaching. About two of these grades on these exams will be dropped if this improves your grades, except for the last few exams, to discourage behavior that one, being satisfied with the grades, does not take the last few exams. A grade zero assigned to an exam missed without a proper excuse will not be dropped either. No makeup exams will be given. In case of a missed exam, please talk to me how to re-weigh your other exams. A grade less than 30 out of 100 on the final will result in a course grade of F regardless of the class exam grades. Irregular attendance or being late to class often may result in a grade worse than indicated by exam averages.

Final Exam. Tuesday, May 25, 6-8 pm. The exam will be posted on Blackboard as an assignment.

Web Site. Course material may be put on the Web site:

http://www.sci.brooklyn.cuny.edu/~mate/midprob/

Note carefully that the character before "mate" in the above address is a *tilde*, found on the top left-hand side of the keyboard.

Department Web Site.

http://depthome.brooklyn.cuny.edu/math/

Syllabus. (What follows is the official class syllabus. The actual material covered, and the order in which it is covered may be slightly different, to best take advantage of the resources offered by the textbooks.)

- 1. Descriptive Statistics
 - Graphical Representations for sampled data
 - Measures of Central Tendency
 - Measures of Spread
 - Paired data and sample correlation
- 2. Combinatorial Analysis
 - Basic Principle of Counting
 - Permutations
 - Combinations
 - Multinomial Coefficients

- 3. Probability Spaces
 - Sample Spaces and Events
 - Axioms of Probability
 - Equiprobable Spaces
 - Conditional Probability; Bayes' Formula
 - Independence
- 4. Generalities about Random Variables
 - Cumulative Distribution Function
 - Expectation, Variance
 - Indicator Functions; Expectation of Sums
 - Moment Generating Functions
- 5. Discrete Random Variables
 - Bernoulli and Binomial Random Variables
 - Poisson Random Variable
 - Geometric and Negative Binomial Random Variables
- 6. Continuous Random Variables
- Uniform Random Variable
 - Exponential Random Variables
 - Normal Random Variable
- Gamma, Beta and Cauchy Random Variables
- 7. Bivariate Random Variables
 - Joint Distributions
 - Covariance, correlation
 - Independent Random Variables
 - Sums of Independent Random Variables; Convolutions
 - Functions of Random Variables; Change of Variables Formula
 - (Univariate and Bivariate)
- 8. Limit Theorems
 - Markov and Chebyshev Inequalities; Chernoff Bounds
 - Law of Large Numbers
 - Statement of Central Limit Theorem and Applications

The inclusion of the following in the syllabus is mandated by Brooklyn College

Academic Integrity. The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for implementing this policy can both be found at this site:

http://www.brooklyn.cuny.edu/bc/policies

If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the students admits the violation, the faculty member MUST report the violation.

Plagiarism. Submitting the work of another person or persons without proper attribution is considered plagiarism, and will be treated accordingly. Proper attribution requires identifying the source of your work. Failure to do so may result in a charge of plagiarism, and students can be subject to administrative actions, including

- \bullet A 0 grade on the assignment or exam,
- An F grade in the course.

Additional actions may be taken by the College, including admonition, warning, censure, disciplinary probation, restitution, suspension, expulsion, complaint to civil authorities, and ejection.

Students with disabilities. In order to receive disability-related academic accommodations students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up and appointment with the Director of the Center for Student Disability Services at 718-951-5538. If you have already registered with the center for Student Disability Services please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.