

## MATH 500 – Probability (Fall 2026)

(as of April 23, 2026)

### Land Acknowledgement

Emory University acknowledges the Muscogee (Creek) people who lived, worked, produced knowledge on, and nurtured the land where Emory's Oxford and Atlanta campuses are now located. In 1821, fifteen years before Emory's founding, the Muscogee were forced to relinquish this land. We recognize the sustained oppression, land dispossession, and involuntary removals of the Muscogee and Cherokee peoples from Georgia and the Southeast. Emory seeks to honor the Muscogee Nation and other Indigenous caretakers of this land by humbly seeking knowledge of their histories and committing to respectful stewardship of the land.

**Instructor:** Dr. Manuela Girotti

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**Lectures:** *Tuesdays and Thursdays, 8:30am–9:45am*  
*White Hall, room 110*

**Office hours:** **TBD**

**Prerequisites:** Undergraduate real analysis (MATH 411 and 412, or equivalent) is the primary requirement. We will introduce measure theory results as needed, but this material is covered more thoroughly in MATH 512.

**Overview:** The goal of the course is to introduce the mathematical foundations of Probability Theory.

We will study fundamental ideas like random variables and their convergence types; basic objects like characteristic functions and measure-theoretic integrals; and how to use them to prove major results like the Law of Large Numbers and the Central Limit Theorem in complete generality.

**Evaluations:** There will be  $\geq 1$  home-assignment.

The final course mark will be calculated as follows :

homework: 50%

final: 50%

Final letter grades are assigned according to the LGS Student Handbook:

Grade	F	C	B-	B	B+	A-	A
Meaning	Failing	Marginal	Satisfactory			Superior	

**Textbook:** The main textbook that we will follow is

Jacod, J. and Protter, P. *Probability Essentials*. 2nd edition. Springer. 2004.

**Additional bibliography:**

Various iterations of this class around the country have put course notes online, which you may also like to read (these are hyperlinks online): Amir Dembo's Stat 310 notes (Stanford) are [here](#), Erik Bates's Math 546 notes (North Carolina State) are [here](#), and Joe Blitzstein's Stat 210 notes (Harvard) are [here](#).

Below there is a small list of books which could be a useful alternative for review or home-study:

- Durrett, R. *Probability: Theory and Examples*. 5th Edition. Cambridge. 2019.
- Resnik, S. *A Probability Path*. 1st edition. Springer. 2014.
- Billingsley, P. *Probability and Measure*. Anniversary edition. Wiley Series in Probability and Statistics. 2012.

**Academic Integrity:** This course will adhere to the Emory University Academic Honor Code <http://catalog.college.emory.edu/policies/honor-code.html>

**Accommodation:** Emory University is committed to providing reasonable accommodations for all persons with disabilities. Students with disabilities who need accommodations shall contact the [Department of Accessibility Services](#) to learn more about the registration process and steps for requesting accommodations. Students who have accommodations in place are encouraged to coordinate with the instructor during the first week of the semester to communicate your specific needs for the course.