UCLA MFE Math Bootcamp

Summer 2025

Instructor:	Charles Rambo	**Time:**	TThu 5:30 – 7:00 PDT
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Objective: This course is designed to prepare incoming MFE students for the UCLA MFE program. It will be taught at an upper-division undergraduate level.

Course Material: Slides, homework assignments, and code snippets can be found on my personal GitHub:

`https://github.com/charlesrambo/math_bootcamp_25`

Zoom: Meetings will be via Zoom.

Meeting ID	Link
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References: This is an incomplete list of references used to create the notes for this course. You do not need to purchase any of the books listed.

- James Stewart, *Calculus*, Brooke/Cole, 3rd ed., 1995.
- Walter Rudin, *Principles of Mathematical Analysis*, McGraw-Hill, 1976.
- Charles Pugh, *Real Mathematical Analysis*, Springer, 2002.
- Serge Lang, *Linear Algebra*, Springer, 3rd ed., 1987.
- Steven Roman, *Advanced Linear Algebra*, Springer, 2nd ed., 2005.
- Morris DeGroot and Mark Schervish, *Probability and Statistics*, Pearson, 4th ed., 2013.
- Marcos Lopez de Prado, *Machine Learning for Asset Managers*, Cambridge University Press, 2020.
- Martin Haugh, *A Brief Introduction to Stochastic Calculus*, Access date June 2024, ⟨`https://www.columbia.edu/~mh2078/FoundationsFE/IntroStochCalc.pdf`⟩, Columbia University, 2016.

Tentative Course Outline:

Unit	Description	Sessions
1	Calculus	July 9-18
2	Linear algebra and multivariable calculus	July 23-August 1
3	Combinatorics, probability, and statistics	August 6-15
4	Covariance matrices, PCA, and stochastic calculus	August 20-22

Assignments and Grading Policy: There will be three homework assignments each worth 33% of your grade. You must receive an average score of at least 65% on the assignments to pass. One additional make-up assignment will be available for students that missed one or whose overall score is too low to pass. The assignments will be posted on my GitHub. Submit your solutions via email. If you choose to work in teams, only submit one assignment per team. Remember to place everyone's name on the top of the team's solutions. Groups may not contain more than four people. The course is P/NP. No letter grades will be given.