

Proof-Based Math Readings

Session: Measure Theoretic Probability*

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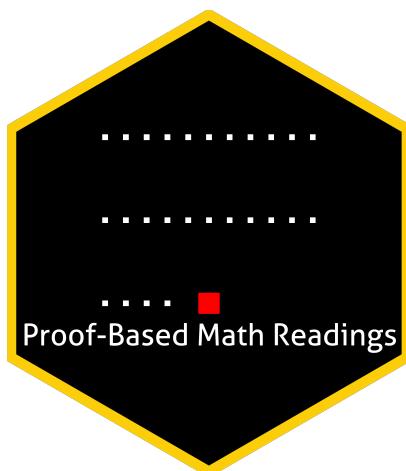
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Version: 20 November 2025, 03:57 PM

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0 Motivation

- *Proof-Based Math Readings* is a free, independent online reading group where we study the mathematics required for economics master's and PhD programs through an intuitive approach. Active since May 2023.
- This session of the reading group is on *Measure Theoretic Probability*.

1 Prerequisites and Format

- Proof Techniques and Real Analysis resources below.
- Please use the  Application Form to join our reading group; you will receive a response within a week.
- This session takes 12 weeks. We do not have face-to-face/online meetings due to the size of the group.
- Members read the main book and discuss the topics/exercises in the Proof-Based Math Readings Discord .

2 Resources

2.1 Main Book and Main Book's Playlist

A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2025) is our main book for this session because it is well-written and well-structured.

Jem Corcoran's playlist is our main playlist because her narrative is great.

- ❑ A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2025)
- ❑ A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2025, Errata)
- ❑ A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2025, Solutions)
- ▶ A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2025, Playlist by J. Corcoran)

2.2 Supplementary

2.2.1 Measure Theoretic Probability

- ❑ Probability: Theory and Examples - Rick Durrett (5th Edition, 2019)
- ❑ Probability: Theory and Examples - Rick Durrett (5th Edition, 2019, Solutions by Hoil Lee, Wonjun Seo)
- ▶ Probability: Theory and Examples - Rick Durrett (5th Edition, 2019, Solutions by Luke Andrejek)
- ▶ Measure Theoretic Probability I - Supriyo Bhar (2021)
- ▶ Probability Foundations - Krishna Jagannathan (2020)

2.2.2 Proof Techniques

- ❑ Book of Proof - Richard Hammack (3.4 Edition, 2025)
- ▶ Book of Proof - Richard Hammack (3.4 Edition, 2025, Playlist by Jeremy Teitelbaum)
- ▶ Book of Proof - Richard Hammack (3.4 Edition, 2025, Playlist by Michael Penn)

2.2.3 Real Analysis

- ❑ Basic Analysis I: Introduction to Real Analysis - Jiri Lebl (Version 6.2, 2025)
- ▶ Basic Analysis I: Introduction to Real Analysis - Jiri Lebl (Version 6.2, 2025, Playlist by Casey Rodriguez)
- ▶ Introduction To Metric Spaces - Paige Bright (2023)

3 Reading Schedule

RPT is the abbreviation of **A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2020)**.

 RPT	Week 01-02 
Appendix A: Mathematical Background Chapter 1: The need for measure theory Chapter 2: Probability triples	
 RPT	Week 03-04 
Chapter 3: Further probabilistic foundations Chapter 4: Expected values	
 RPT	Week 05-06 
Chapter 5: Inequality and convergence Chapter 6: Distributions of random variables	
 RPT	Week 07-08 
Chapter 9: More probability theorems Chapter 10: Weak convergence	
 RPT	Week 09-10 
Chapter 11: Characteristic functions	
 RPT	Week 11-12 
Chapter 12: Decomposition of probability laws Chapter 13: Conditional probability and expectation	

4 Further Readings (Optional)

Our Measure Theory syllabus at  github.com/zekiakyol/proof-based-math-readings