Proof-Based Math Readings
Session: Measure Theoretic Probability*

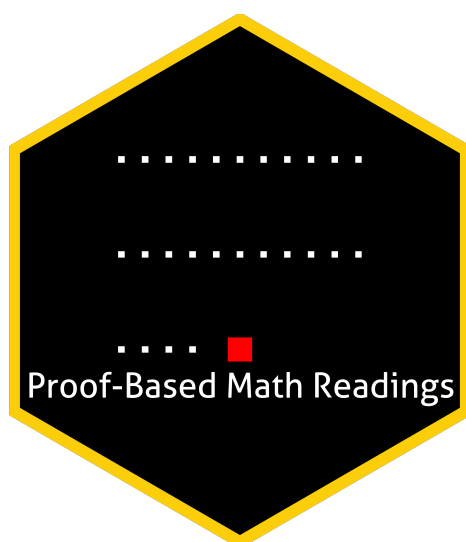**Zeki Akyol**

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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

- 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.

2 Format

- 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 🎮.

3 Resources

3.1 Main Book and Main Book's Playlist

A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2020) 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 2020)

- 📑 A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2020, Errata)

- 📑 A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2020, Solutions)

- ▶ A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal (2nd Edition, 2006 or 2020, Playlist by J. Corcoran)

3.2 Supplementary

3.2.1 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)

3.2.2 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)

3.2.3 Real Analysis

- 📑 Basic Analysis I: Introduction to Real Analysis - Jiri Lebl (Version 6.1, 2024)

- ▶ Basic Analysis I: Introduction to Real Analysis - Jiri Lebl (Version 6.1, 2024, Playlist by Casey Rodriguez)

- ▶ Introduction To Metric Spaces - Paige Bright (2023)

4 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

5 Further Readings (Optional)

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