

Proof-Based Math Readings

Session: Measure Theoretic Probability

2024 Fall

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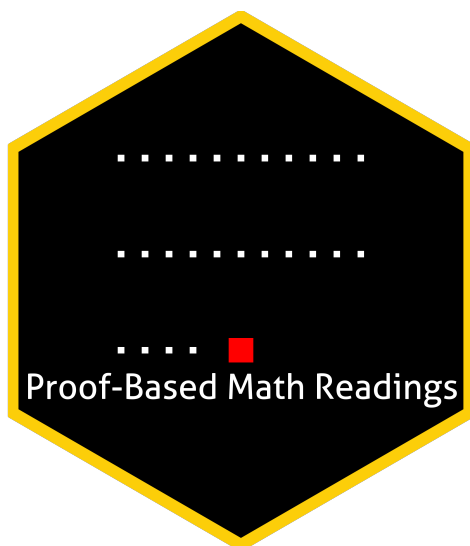
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0 Motivation

- *Proof-Based Math Readings* is a free and independent online reading group where we study mathematics required in economics master's/PhD programs using an intuitive approach.
- This session of the reading group is on *Measure Theoretic Probability*.

1 Prerequisites

- CGPA: 3.00/4.00.
- Proof and Real Analysis resources below are the prerequisites for this session.
- Please use the  [Application Form](#) to join our reading group anytime.
- Applicants are informed about their application results within a week via email.

2 Format





- This session takes 12 weeks.
- We discuss the topics/exercises that we struggle with at  [Proof-Based Math Readings \[Discord\]](#).
- We do not have face-to-face/online meetings due to the size of the group.
- Members are expected to read the chapters, and watch the chapter videos from the book's playlist.

3 Resources

3.1 Main Book and Main Book's Playlist

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


-  [A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal \(2nd Edition, 2006\)](#)
-  [A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal \(2nd Edition, 2006, Errata\)](#)
-  [A First Look at Rigorous Probability Theory - Jeffrey S. Rosenthal \(2nd Edition, 2006, Solutions\)](#)
-  [Measure Theoretic Probability - Jem Corcoran \(Companion playlist, 2024\)](#)

3.2 Supplementary






3.2.1 Proof

-  [Book of Proof - Richard Hammack \(3.3 Edition, 2022\)](#)
-  [Book of Proof - Richard Hammack \(3.3 Edition, 2022, Companion playlist by Jeremy Teitelbaum\)](#)
-  [Book of Proof - Richard Hammack \(3.3 Edition, 2022, Companion playlist by Michael Penn\)](#)

3.2.2 Real Analysis

-  [Basic Analysis I: Introduction to Real Analysis \[Volume I\] - Jiri Lebl \(Version 6.0, 2023\)](#)
-  [Real Analysis - Casey Rodriguez \(2020, Companion playlist to Basic Analysis I\)](#)
-  [Introduction To Metric Spaces - Paige Bright \(2023\)](#)


3.2.3 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 \(2020\)](#)

4 Reading Schedule


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

 **RPT**

Week 01-02 


A: Mathematical Background
Chapter 1: The need for measure theory
Chapter 2: Probability triples

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Week 03-04 


Chapter 3: Further probabilistic foundations
Chapter 4: Expected values

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Week 05-06 


Chapter 5: Inequality and convergence
Chapter 6: Distributions of random variables

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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