

# Proof-Based Math Readings

## Session: Measure Theory\*

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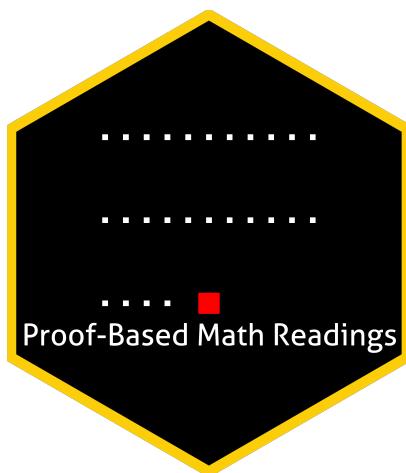
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\*[zekiakyol.com](http://zekiakyol.com)

# 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 Theory*.

# 1 Prerequisites and Format

- Proof Techniques, Real Analysis, and Topology 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 [All are open-access]

## 2.1 Main Book and Main Book's Playlist

**Measure, Integration & Real Analysis - Sheldon Axler (2025, Errata-free version)** is our main book for this session because it is well-written, well-structured, and open-access.

- █ Measure, Integration & Real Analysis - Sheldon Axler (2025, Errata-free version)
- ▶ Measure, Integration & Real Analysis - Sheldon Axler (202X, Playlist) → will be added after the 2nd edition.

## 2.2 Supplementary

### 2.2.1 Measure Theory

- ▶ Measure Theory - The Bright Side of Mathematics (2025)
- ▶ Measure Theory - Indrava Roy (2020)
- ▶ A horizontal integral?! Introduction to Lebesgue Integration - vcubingx (2020)
- ▶ The Lebesgue Integral - BBC (1975)

### 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

- █ Measure, Integration & Real Analysis - Sheldon Axler (2025, Supplement)
- █ 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

- MIRA is the abbreviation of Measure, Integration & Real Analysis - Sheldon Axler (2025).

<b>MIRA, Chapter 1: Riemann Integration</b>	Week 01
1A Review: Riemann Integral 1B Riemann Integral Is Not Good Enough	
<b>MIRA, Chapter 2: Measures</b>	Week 02-03-04-05
2A Outer Measure on $\mathbb{R}$ 2B Measurable Spaces and Functions 2C Measures and Their Properties 2D Lebesgue Measure 2E Convergence of Measurable Functions	
<b>MIRA, Chapter 3: Integration</b>	Week 06-07-08
3A Integration with Respect to a Measure 3B Limits of Integrals & Integrals of Limits	
<b>MIRA, Chapter 4: Differentiation</b>	Week 09
4A Hardy–Littlewood Maximal Function 4B Derivatives of Integrals	
<b>MIRA, Chapter 5: Product Measures</b>	Week 10-11-12
5A Products of Measure Spaces 5B Iterated Integrals 5C Lebesgue Integration on $\mathbb{R}^n$	

### 4 Further Readings (Optional)

Our Measure Theoretic Probability syllabus at [github.com/zekiakyol/proof-based-math-readings](https://github.com/zekiakyol/proof-based-math-readings)