

# Proof-Based Math Readings

## Session: Real Analysis\*

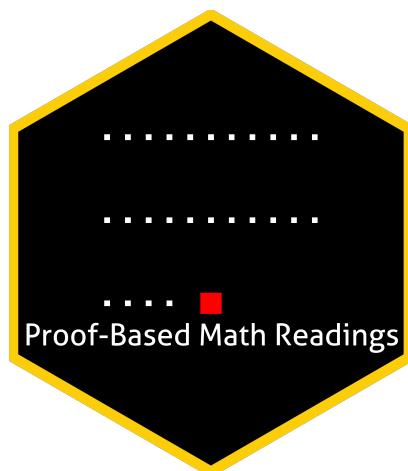
Zeki Akyol

Department of Economics  
University of California, Santa Cruz  
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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 *Real Analysis*.

# 1 Prerequisites and Format

- Proof Techniques 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

**Basic Analysis I: Introduction to Real Analysis - Jiri Lebl (Version 6.3, 2026)** is our main book for this session because it is well-written, well-structured, and open-access.

Casey Rodriguez's playlist is our main playlist because his narrative is great.

-  [Basic Analysis I: Introduction to Real Analysis - Jiri Lebl \(Version 6.3, 2026\)](#)
-  [Basic Analysis I: Introduction to Real Analysis - Jiri Lebl \(Version 6.3, 2026, Playlist by Casey Rodriguez\)](#)
-  [Basic Analysis I: Introduction to Real Analysis - Jiri Lebl \(Version 6.3, 2026, Notes by Casey Rodriguez\)](#)

## 2.2 Supplementary

### 2.2.1 Real Analysis

-  [Real Analysis - Wrath of Math \(2025\)](#) → Start with this playlist if you find the main book challenging
-  [Real Analysis - Michael Penn \(2021\)](#)
-  [Understanding Analysis - Stephen Abbott \(2nd Edition, 2016, Playlist by Marc Renault\)](#)
-  [Understanding Analysis - Stephen Abbott \(2nd Edition, 2016, Solutions by Ulisse Mini, Jesse Liby\)](#)

### 2.2.2 Calculus

-  [Essence of Calculus - 3Blue1Brown \(2023\)](#)
-   [Single Variable Calculus - David Jerison \(2006\)](#) and [Multivariable Calculus - Denis Auroux \(2007\)](#)
-  [Sequences and Series Calculator - Geogebra](#)
-  [Function Graph - Geogebra](#)

### 2.2.3 Proof Techniques

-  [Book of Proof - Richard Hammack \(3.4 Edition, 2025\)](#)
-  [Book of Proof - Richard Hammack \(3.4 Edition, 2025, Playlist by Jeremy Teitelbaum, Chapters 1-12\)](#)
-  [Book of Proof - Richard Hammack \(3.4 Edition, 2025, Playlist by Michael Penn, Chapters 1-14\)](#)

### 3 Reading Schedule

- BAI is the abbreviation of Basic Analysis I: Introduction to Real Analysis - Jiri Lebl (Version 6.3, 2026).

<b>BAI, Chapter 0: Introduction</b>	Week 01
List of Notation (Page 309-312) <b>0.1</b> About this book <b>0.2</b> About analysis <b>0.3</b> Basic set theory	
<b>BAI, Chapter 1: Real Numbers</b>	Week 02
<b>1.1</b> Basic properties <b>1.2</b> The set of real numbers <b>1.3</b> Absolute value and bounded functions <b>1.4</b> Intervals and the size of $\mathbb{R}$	
<b>BAI, Chapter 2: Sequence and Series</b>	Week 03-04-05
<b>2.1</b> Sequences and limits <b>2.2</b> Facts about limits of sequences <b>2.3</b> Limit superior, limit inferior, and Bolzano-Weierstrass <b>2.4</b> Cauchy sequences <b>2.5</b> Series	
<b>BAI, Chapter 3: Continuous Functions</b>	Week 06-07-08
<b>3.1</b> Limits of functions <b>3.2</b> Continuous functions <b>3.3</b> Extreme and intermediate value theorems <b>3.4</b> Uniform continuity	
<b>BAI, Chapter 4: The Derivative</b>	Week 09-10
<b>4.1</b> The derivative <b>4.2</b> Mean value theorem <b>4.3</b> Taylor's theorem	
<b>BAI, Chapter 5: The Riemann Integral</b>	Week 11-12
<b>5.1</b> The Riemann integral <b>5.2</b> Properties of the integral <b>5.3</b> Fundamental theorem of calculus	

### 4 Further Readings (Optional)

▶ Introduction To Metric Spaces - Paige Bright (2023)