

Proof-Based Math Readings

Session: Topology*

Zeki Akyol

Department of Economics

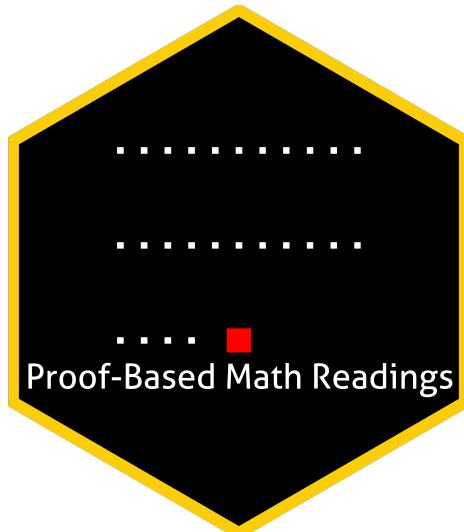
Istanbul Technical University

[Click here for the most recent version](#)

Version: 27 June 2025, 03:26 PM

Table of contents

0 Motivation	2
1 Prerequisites	2
2 Format	2
3 Resources	2
3.1 Main Book and Main Book's Playlist	2
3.2 Supplementary	2
3.2.1 Topology	2
3.2.2 Proof Techniques	2
3.2.3 Real Analysis	2
4 Reading Schedule	3
5 Further Readings (Optional)	3



*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 *Topology*.

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

Topology - James Munkres (2nd Edition, 2014) is our main book for this session because it is well-written, well-structured, and has plenty of intuitive figures.

- ❑ Topology - James Munkres (2nd Edition, 2014)
- ❑ Topology - James Munkres (2nd Edition, 2014, Playlist by Bruno Zimmermann, Video 1-15)
- ❑ Topology - James Munkres (2nd Edition, 2014, Solutions for Chapter 1-2 by Dan Whitman)
- ❑ Topology - James Munkres (2nd Edition, 2014, Solutions for Chapter 1-2 by solverer)
- ❑ Topology - James Munkres (2nd Edition, 2014, Solutions for Chapter 2-3 by positron0802)
- ❑ Topology - James Munkres (2nd Edition, 2014, Solutions for Chapter 1-2-3-4 by dbFin)

3.2 Supplementary

3.2.1 Topology

- ❑ Schaum's Outline of General Topology - Seymour Lipschutz (2011) → Beginner friendly and contains solutions
- ❑ Topology Without Tears - Sidney A. Morris (2024) → Beginner friendly and open-access
- ❑ General Topology - Bernard Badzioch (2020)
- ❑ Intuitive Topology - Troy Kling (2021)
- ❑ Topology - Marius Furter (2022)
- ❑ Topology - Michael Penn (2025)

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)

3.2.3 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)

4 Reading Schedule

TM is the abbreviation of **Topology - James Munkres (2nd Edition, 2014)**.

Week	TM, Chapter 1: Set Theory and Logic	Week	TM, Chapter 2: Topological Spaces and Continuous Functions	Week	TM, Chapter 3: Connectedness and Compactness
Week 01	<ul style="list-style-type: none">1 Fundamental Concepts2 Functions3 Relations4 The Integers and the Real Numbers5 Cartesian Products6 Finite Sets7 Countable and Uncountable Sets8 The Principle of Recursive Definition9 Infinite Sets and the Axiom of Choice10 Well-Ordered Sets11 The Maximum Principle	Week 02-03-04-05-06-07	<ul style="list-style-type: none">12 Topological Spaces13 Basis for a Topology14 The Order Topology15 The Product Topology on $X \times Y$16 The Subspace Topology17 Closed Sets and Limit Points18 Continuous Functions19 The Product Topology20 The Metric Topology21 The Metric Topology (continued)	Week 08-09-10-11-12	<ul style="list-style-type: none">23 Connected Spaces24 Connected Subspaces of the Real Line25 Components and Local Connectedness26 Compact Spaces27 Compact Subspaces of the Real Line28 Limit Point Compactness29 Local Compactness

5 Further Readings (Optional)

Our Measure Theory and Measure Theoretic Probability syllabuses at github.com/zekiakyol/proof-based-math-readings