

Proof-Based Math Readings

Session: Graph Theory

2025 Summer

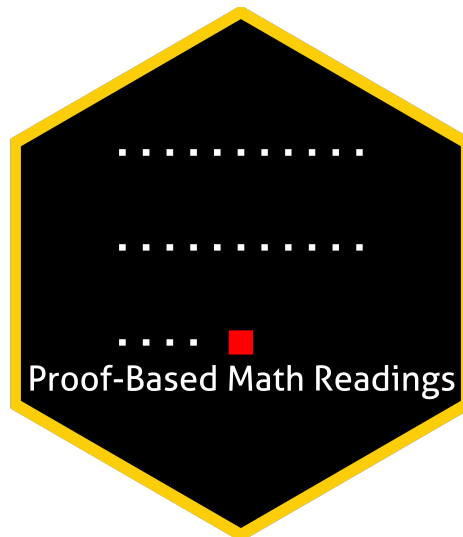
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0 Motivation

- *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 *Graph Theory*.

1 Prerequisites

- Proof Techniques 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 Course in Graph Theory - Gary Chartrand, Ping Zhang (2012) is our main book because it is well-written and well-structured.

Mikhail Lavrov's playlist is our playlist because the narrative is great.

-  A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012)
-  A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012, Playlist by Mikhail Lavrov)
-  A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012, Playlist by Wrath of Math)
-  A First Course in Graph Theory - Gary Chartrand, Ping Zhang (2012, Notes by Evan Chen)

3.2 Supplementary

3.2.1 Graph Theory

-  Introduction to Graph Theory: A Computer Science Perspective - Reducible (2020)
-  Graph Theory - Don Sheehy (2020)
-  D3 Graph Theory (Interactive)
-  Graph Online (Interactive)

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)

4 Reading Schedule

FCGT is the abbreviation of **A First Course in Graph Theory** - Gary Chartrand, Ping Zhang (2012).

 FCGT	Week 01 
Appendix 1: Sets and Logic Appendix 2: Equivalence Relations and Functions Appendix 3: Methods of Proof	
 FCGT	Week 02 
Chapter 1: Introduction	
 FCGT	Week 03-04 
Chapter 2: Degrees Chapter 3: Isomorphic Graphs	
 FCGT	Week 05-06 
Chapter 4: Trees Chapter 5: Connectivity	
 FCGT	Week 07-08 
Chapter 6: Traversability Chapter 7: Digraphs	
 FCGT	Week 09-10 
Chapter 8: Matchings and Factorization Chapter 9: Planarity	
 FCGT	Week 11-12 
Chapter 10: Coloring Graphs	

5 Further Readings (Optional)

 Graphs and Digraphs - G. Chartrand, H. Jordon, V. Vatter, P. Zhang (7th Edition, 2024)