

Proof-Based Math Readings

Session: Graph Theory

2025 Summer

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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 *Graph Theory*.

1 Prerequisites

- CGPA: 3.00/4.00.
- Proof 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 Course in Graph Theory - Gary Chartrand, Ping Zhang (2012) is our main book because it is well-structured and well-written.

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 Proof

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

3.2.2 Graph Theory

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


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)

If we want to read a more comprehensive book, the following book is great from the same authors.

 **Graphs and Digraphs - Gary Chartrand, Heather Jordon, Vincent Vatter, Ping Zhang (7th Edition, 2024)**