

# 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).

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

## 5 Further Reading (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)