

# 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.
- 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 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

-  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)

## 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 Readings (Optional)

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