Proof-Based Math Readings
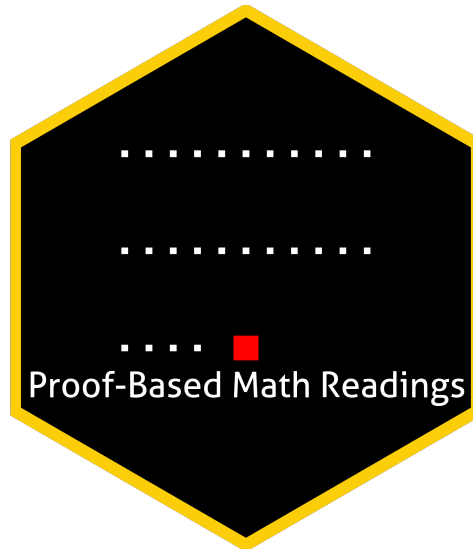# Session: Numerical Linear Algebra
2025 Summer

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Click here for the most recent versions of the syllabuses

Version: 25 July 2024, 02:47 PM

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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 *Numerical Linear Algebra*.

1   Prerequisites

- CGPA: 3.00/4.00.
- Proof book/playlists 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

Numerical Linear Algebra - Lloyd N. Trefethen, David Bau III (1997 or 2022) is our main book because it is well-structured and well-written.

📖 Numerical Linear Algebra - Lloyd N. Trefethen, David Bau III (1997 or 2022)

📖 Numerical Linear Algebra - Lloyd N. Trefethen, David Bau III (1997 or 2022, Errata)

📖 Numerical Linear Algebra - Lloyd N. Trefethen, David Bau III (1997 or 2022, Solutions by Youngdo Lee)

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   Numerical Linear Algebra

📖 Matrix Computations - Gene H. Golub, Charles F. Van Loan (4th Edition, 2013)

📖 Matrix Computations - Gene H. Golub, Charles F. Van Loan (4th Edition, 2013, Errata and M-files)

4 Reading Schedule

- **NLA** is the abrevviation of **Numerical Linear Algebra - Lloyd N. Trefethen, David Bau III (1997 or 2022)**.

📘 **NLA**   **Week 01-02** 📅

Part I: Fundamentals

📘 **NLA**   **Week 03-04** 📅

Part II: QR Factorization and Least Squares

📘 **NLA**   **Week 05-06** 📅

Part III: Conditioning and Stability

📘 **NLA**   **Week 07-08** 📅

Part IV: Systems of Equations

📘 **NLA**   **Week 09-10** 📅

Part V: Eigenvalues

📘 **NLA**   **Week 11-12** 📅

Part VI: Iterative Methods