

Proof-Based Math Readings

Session: Bayesian Statistics*

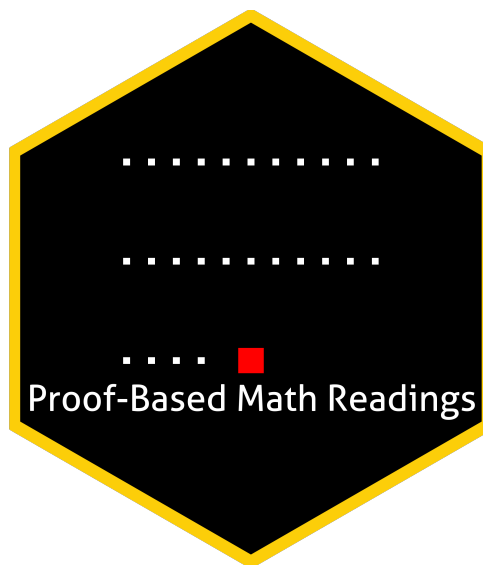
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0 Motivation

- *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 *Bayesian Statistics*.

1 Prerequisites

- Proof Techniques and Statistics 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

Bayesian Econometrics - Gary Koop (2003) is our main book for this session because it is well-written and well-structured.

Gary Koop's playlist is our main playlist because his narrative is great.

-  Bayesian Econometrics - Gary Koop (2003)
-  Bayesian Econometrics - Gary Koop (2003, Errata)
-  Bayesian Econometrics - Gary Koop (2003, Playlist)

3.2 Supplementary



3.2.1 Bayesian Statistics

-  Bayes Rules! - Alicia A. Johnson, Miles Q. Ott, Mine Dogucu (2021)
-  Bayesian Statistics: A Comprehensive Course - Ben Lambert (2014)
-  A Student's Guide to Bayesian Statistics - Ben Lambert (2020)
-  Bayesian Data Analysis - A. Gelman, J. Carlin, H. Stern, D. Dunson, A. Vehtari, D. Rubin (3rd Ed., 2025)
-  Bayesian Data Analysis - A. Gelman, J. Carlin, H. Stern, D. Dunson, A. Vehtari, D. Rubin (3rd Ed., 2025, Playlist)
-  Explaining the Gibbs Sampler - George Casella, Edward I. George (1992)
-  Understanding the Metropolis-Hastings Algorithm - Siddhartha Chib, Edward Greenberg (1995)

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)

3.2.3 Statistics

-  Introduction to Probability - Dimitri Bertsekas, John Tsitsiklis (2nd Edition, 2008, Summary Material)
-  Introduction to Probability - Dimitri Bertsekas, John Tsitsiklis (2nd Edition, 2008, Playlist)
-  Introduction to Probability - Dimitri Bertsekas, John Tsitsiklis (2nd Edition, 2008, Solutions & Errata)

4 Reading Schedule

- BE is the abbreviation of **Bayesian Econometrics** - Gary Koop (2003).

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
|  BE | Week 01  |
| Appendix A Introduction to Matrix Algebra Appendix B Introduction to Probability and Statistics 1 An Overview of Bayesian Econometrics | |
|  BE | Week 02  |
| 2 The Normal Linear Regression Model with Natural Conjugate Prior and a Single Explanatory Variable | |
|  BE | Week 03-04  |
| 3 The Normal Linear Regression Model with Natural Conjugate Prior and Many Explanatory Variables | |
|  BE | Week 05-06  |
| 4 The Normal Linear Regression Model with Other Priors | |
|  BE | Week 07-08  |
| 5 The Nonlinear Regression Model | |
|  BE | Week 09-10  |
| 6 The Linear Regression Model with General Error Covariance Matrix | |
|  BE | Week 11-12  |
| 7 The Linear Regression Model with Panel Data | |

5 Further Readings (Optional)

-  Bayesian Econometric Methods - Joshua Chan, Gary Koop, Dale Poirier, Justin Tobias (2nd Edition, 2019)
-  Bayesian Econometric Methods - Joshua Chan, Gary Koop, Dale Poirier, Justin Tobias (2nd Edition, 2019, Errata)