

# Proof-Based Math Readings

## Session: Bayesian Statistics\*

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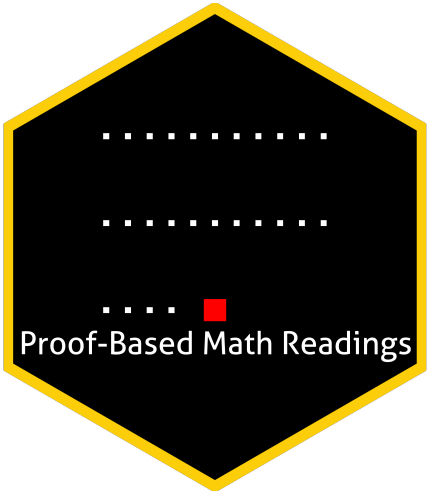
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## 0 Motivation

- *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 and Format




- Proof Techniques and Statistics resources below.
- Please use the  [Application Form](#) to join our reading group; you will receive a response within a week.
- 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 .

## 2 Resources

### 2.1 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 \(2003, Playlist\)](#)

### 2.2 Supplementary




#### 2.2.1 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 \(1995\)](#)

#### 2.2.2 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 \(3.4 Edition, 2025, Playlist by Michael Penn\)](#)

#### 2.2.3 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 \(2nd Edition, 2008, Solutions & Errata\)](#)

### 3 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	

### 4 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)