

# Proof-Based Math Readings

## Session: Bayesian Statistics

2024 Winter

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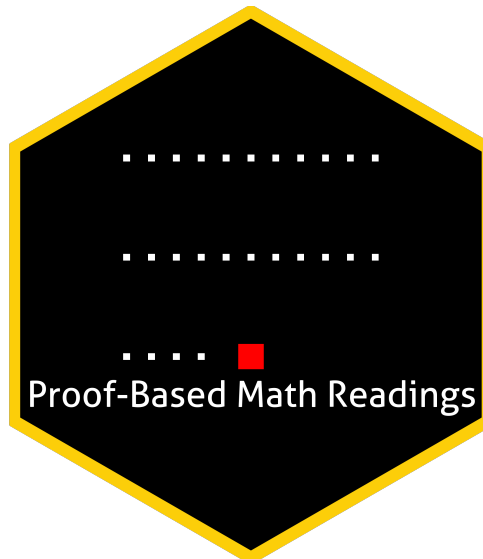
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### Table of contents

<b>0 Motivation</b>	<b>2</b>
<b>1 Prerequisites</b>	<b>2</b>
<b>2 Format</b>	<b>2</b>
<b>3 Resources</b>	<b>2</b>
3.1 Main Book and Main Book's Playlist . . . . .	2
3.2 Supplementary . . . . .	2
3.2.1 Bayesian Statistics . . . . .	2
3.2.2 Proof Techniques . . . . .	2
3.2.3 Statistics . . . . .	2
<b>4 Reading Schedule</b>	<b>3</b>
<b>5 Further Readings (Optional)</b>	<b>3</b>



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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., 2024)
-  Bayesian Data Analysis - A. Gelman, J. Carlin, H. Stern, D. Dunson, A. Vehtari, D. Rubin (3rd Ed., 2024, 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 (3.3 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)

#### 3.2.3 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 
<b>Appendix A</b> Introduction to Matrix Algebra <b>Appendix B</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)