

Statistics 6570: Applied Bayesian Analysis

Spring 2020

Instructor:

Dr. Xinyi Xu

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Office Hours: M 3-4pm or by appointment

Grader:

Kumar Somnath

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Office Hours: W 12:45-2:45pm at PO 161

* Please send emails from an OSU email address.

Lecture Hours: TTh 12:40-2:30pm in University Hall 0056

Prerequisites:

Prerequisites: STAT 6301 or STAT 6801, or permission of instructor.

Prerequisites or concurrence: STAT 6450 or STAT 6950, and STAT 6302 [with 6301 prerequisite] or STAT 6802 [with 6801 prerequisite].

Text:

Gelman, A., Carlin, J.B., Stern, H., Dunson, D., Vehtari, A., and Rubin, D. *Bayesian Data Analysis, Third Edition*. Chapman and Hall, 2014.

Course Description:

This course aims to provide a practical introduction to Bayesian data analysis. Students will be exposed to a variety of Bayesian models including the Bayesian linear model for normal and non-normal data. Bayesian hierarchical modeling will be discussed as a strategy for modeling complex processes and as a means of assimilating a variety of sources of data. Simulation-based methods for model-fitting will be introduced, and students will learn to use the JAGS software in addition to programming basic MCMC algorithms in R.

Website:

Important announcements, lecture notes, homework problems and solutions, and other information about the course will be posted on **Carmen** (<http://www.carmen.osu.edu>).

Computing:

We will be using the R statistical computing package. No prior knowledge of R is necessary, although previous experience may be helpful. R is available in the Department of Statistics computing laboratory and may be downloaded for free. Information on R will be provided on Carmen. Most homework assignments will require some computing. Please cut and paste your computer output and graphs into your homework solutions or provide them in a clearly referenced appendix.

Grading:

Homework 30%

Midterm 35%

Final 35%

Final course grades may be curved if necessary.

Homework Assignments:

There will be four homework assignments for the course. You are encouraged to work together on the problems, but each student must hand in his or her own work. **DO NOT COPY** any part of another student's homework including computer output. Use of homework solutions distributed in previous offerings of the course or solutions available on the web constitutes academic misconduct and will be handled according to university rules.

For grading purposes, a *hard copy* of the homework solutions should be submitted at the beginning of class on the due date. The solutions may be handwritten or typed. Please be sure that the questions are clearly labeled, all supporting work (including computer code) can be easily identified, and that all figures/tables are referenced and interpreted in the text.

Solutions to the homework problems will be posted on Carmen. You should assume that solutions to the homework assignments will be posted after class on the day the homework is due, unless you are notified otherwise. Once the solutions have been posted, late homework will not be accepted. If you are unable to come to class the day a homework assignment is due, please contact the instructor. Re-grade requests on the homework problems must be submitted in writing to the course grader within one week of the day homeworks are returned.

Midterm Exam:

There will be an in-class midterm given on Tuesday, April 7th (tentatively).

Final Exam:

There will be a final take-home exam that will be due on Thursday, April 23rd (tentatively).

Academic Misconduct:

Academic misconduct *will not be tolerated* and will be dealt with procedurally in accordance with university policy. Please see the Committee on Academic Misconducts website for details: <http://oaa.osu.edu/coam.html>

Special Accommodations:

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; 098 Baker Hall, 113 W. 12th Avenue.