STAT 425 – INTRODUCTION TO BAYESIAN INFERENCE
SYLLABUS – Fall 2019

Instructor
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Office hours by appointment only

Meeting Time: TR 2.30pm – 3:45pm, DH1075

Attendance: Students should register for the course through Rice University. Those who wish to audit the course should obtain written permission from the Instructors.

Course Description
The aim of this course is to introduce students to the Bayesian statistical modeling and inference and to the related computational strategies and algorithms. The course starts with the treatment of simple models, such as those based on normal and binomial distributions. Concepts of conjugate and non informative priors are illustrated, for single- and multi-parameters models. Basic treatment of hierarchical models and linear regression models are also covered. Bayesian computational methods such as the Gibbs sampler and Metropolis-Hastings algorithms, are briefly presented with an emphasis on their implementation and use on simple cases.

Pre-requisites: STAT 410 AND STAT 405 OR COMP 210 OR COMP 140 OR COMP 130

Course Assignments
Homeworks will be due at the start of the class period on the deadline date. No late homework will be accepted. Illness and family emergencies will be dealt with on an individual basis. Each homework question will be worth 10 points. Graded homeworks will be returned timely. Students must complete 60% of the homeworks to pass the class.

There will be two midterm exams. Students must complete both exams to pass the class.

Grading Policy: Homework: 30%; Test#1: 35%; Test#2: 35%

Textbook
Lecture slides will be made available. The reference textbook is “A first course in Bayesian statistical methods” (2009), by Peter Hoff. Springer Verlag.
Course objectives and learning outcomes:
1. Develop an understanding of the basic concepts underlying the Bayesian approach to statistical thinking.
2. Develop skills and appreciation for the development of Bayesian models and prior choices.
3. Provide basic knowledge on Bayesian computing, for the practical application of Bayesian models to data problems solving.

Honor Code Policy
Students are encouraged to talk to each other, the teaching assistants or the instructor about any homework assignment. This assistance is limited to the discussion of the problem. On written exams you will be asked to write and sign the honor code pledge. With your signature, you pledge that you have not been in communication about this exam with anybody, neither with any other student in the class, nor with any other person, other than the instructor.

Additional policies:
- Students are not allowed to look at homework problems or solutions or quizzes/exams from previous years.
- When turning in homeworks/exams, students are responsible of making sure all codes and outputs are attached to their work. No additional material will be accepted after the due date.
- For midterms, you are allowed to consult the textbook, your notes and the material on the website, including homeworks, but you are not allowed to consult general online resources, including Wikipedia.
- For homeworks and midterms, please use R codes distributed in class, written/modified by yourself, and attach the code to your work. Do not use software platforms (“blackbox”), such as “jags”, “bugs” and “stan”, unless specified by the instructions.
- Questions about grades on homework/midterm papers should be brought to the attention of the Instructor within 5 days from the date you receive the graded papers.

Any student with a documented disability needing academic adjustments or accommodation is requested to speak with me during the first two weeks of class. All discussions will remain confidential. Students with disabilities should also contact Disability Support Services in the Ley Student Center.

Syllabus Change Policy
This syllabus is only a guide for the course and is subject to change with advanced notice.