Statistics 542
Spring 2011

Course Description: Bayesian Methods and Computation

The goal of this course is to develop sophisticated tools for probability modeling and data analysis from the Bayesian perspective. Key topics covered in the course include hierarchical models, mixture models and Monte Carlo simulation techniques.

Prerequisites: Probability (Statistics 430, 510 or equivalent) and Statistics 541 or permission of instructor

Professor:
Dr. Shane Jensen JMHH 463
stjensen@wharton.upenn.edu 215-573-2211

Lectures: TTh 10:30-12:00 JMHH G88

Required Textbook:
Bayesian Data Analysis (2nd Edition) by A. Gelman, J. Carlin, H. Stern, and D. Rubin.

Required Software:
The R statistical package is needed and can be downloaded at `www.r-project.org`

Course Topics

1. Introduction to Bayesian Inference (Ch.1)
2. Simple Parametric Models (Ch. 2, 3)
3. Regression Models from the Bayesian Perspective (Ch. 14,15)
4. Frequentist properties of Bayesian methods (Ch. 4)
5. Hierarchical and Mixture Models (Ch. 5,18)
6. Optimization Algorithms for Model Estimation (Ch. 12)
7. Monte Carlo Simulation Algorithms for Model Estimation (Ch. 10,11,13)
8. Model Checking (Ch. 6)
10. Nonparametric and Semiparametric Bayesian models
11. Hidden Markov Models

Other Course Information

Office hour: Tuesday 3:30-4:30 JMHH 463

Course Website: stat.wharton.upenn.edu/~stjensen/stat542.html

Evaluation:

Your course grade will be calculated from homeworks. Homework assignments will be assigned every three weeks or so and will be turned in for grading. ***No late homework will be accepted, for any reason whatsoever.***

Important Dates:

Thursday, January 13	First day of class
Tuesday, March 8	No Class -- Spring Break
Thursday, March 10	No Class -- Spring Break
Tuesday, April 26	Last day of class