1 Course Description

This course is a continuation of ENG-206. The course will have an emphasis on modeling from a Bayesian perspective. Some of the topics that will be covered include: hierarchical modeling, linear models, regression and analysis of variance, intermediate MCMC, GLMs, multivariate models, mixture models, and hidden Markov models.

Website: [http://www.soe.ucsc.edu/classes/engr207/Spring03/](http://www.soe.ucsc.edu/classes/engr207/Spring03/)

2 Prerequisites

I will assume that everybody in the class has taken ENG-206 or some other introductory course in Bayesian statistics. I will also assume that everybody is familiar with R, BUGS and/or WinBUGS.

3 Course Plan

In this course we will study some of the most popular statistical models from a Bayesian perspective at an intermediate level. Here is a possible week-by-week course plan. This plan is “time-varying”, since I would like to be able to use your input to build a course that emphasizes more some topics than others based on your interests.

- **Week 1.** Hierarchical models: Gaussian models
- **Week 2.** Hierarchical models. Introduction to linear regression models.
- **Week 3.** Linear regression models.
- **Week 4.** MCMC.
- **Week 5.** MCMC.
- **Week 6.** GLMs.
- **Week 7.** GLMs.
- **Week 8.** Mixture models. Multivariate Models.
• Week 9. HMMs or any other topic of your preference such as Spatial Models or Time Series Models.

• Week 10. Presentations.

4 Reading List

The main textbook for the course will be


Supplementary reading material will be taken from


• BUGS Examples Volumes 1 and 2

5 Evaluation

There will be homework assignments given out in weeks 2, 4, 6 and due one week later. There will be an exam given out in class on week 8 and due one day after is handed out. A final project will be assigned at the end of week 8 and due on week 10. The final project will include an oral presentation in class in week 10.

If you have ideas for what you would like to do your project on, please talk to me about it well in advance of the eighth week of class. I will provide a project for everyone who does not select one for her/himself.