STAT9210 (old STAT420): Bayesian Statistics  
Fall Semester, 2006  
**Time:** 11:00-12:15, Tuesday-Thursday  
**Location:** MDLBH 10

**Instructor:** Athanasios Christou Micheas, Ph.D.  
**Office:** 134G Middlebush Buidling  
**Office Hours:** 2:00-3:30, Tuesday-Thursday (Also by appointment)  
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**Course Web Sites:**
- Main: http://www.stat.missouri.edu/~amicheas/stat9210/stat9210.html  

**Text:**

**Some References:**
- Krause and Olson, Statistics and Computing: The basics of S and S-Plus, 2002  

**Prerequisites:** STAT 4760/7760 and MATH 4140/7140 or Instructor’s Permission - Graduate Standing Required

**Topics to be covered:**
- Elements of Bayesian Inference:
  - Bayes theorem, prior, likelihood, posterior, exchangeability, Likelihood Principle, invariance, sufficiency, ancillarity, Bayes factors and Bayes hypothesis testing  
  - Bayes Rule, Credible sets, HPD’s.  
  - Prior selection: subjective, conjugate, non-informative, Jeffreys’, reference, Prior and Posterior robustness  
  - Predictive distribution, Asymptotic properties of posterior, Empirical Bayesian versus Bayes, Laplace approximation.
• Bayesian Decision Theory
  – Frequentist Risk, Bayes Risk, Bayesian Expected Loss
  – Admissibility, Minimaxity, Bayes and Extended Bayes

• Bayesian Modelling:
  – One-parameter Models, Multi-parameter Models, Nuisance parameters, Hierarchical models, model checking, model comparison.

• Computation:
  – Simulation methods.

Homework:
• There will be about seven problem sets assigned during the semester.
• When submitting your homework:
  – Display clearly on the top of the first page: your name(last, first), the course name and section and the assignment number.
  – Homework should be done on standard-size paper (8 1/2" by 11").

Exams:
• There will be a midterm examination and a project final. The date for the exam is as follows
  – Midterm: Thursday, October 17
• Examinations must be taken at the scheduled times. Make-up exams will not be given.
• The exam is closed book. Calculators are allowed to help in numerical calculations.

Grading:
• Your grade will be based on a weighted average of your midterm score (30%), homework average (40%), and project score (30%).