Semester course: STAT 6570 -- 2 CREDIT HOURS

1. Transcript Abbrevation: (maximum 18 characters)
   Appl Bayes Anal

2. Long course title
   Applied Bayesian Analysis

3. Course description: (maximum of 250 characters)
   Introduces various aspects of Bayesian modeling (including conditionally specified models and models for non-normal data) and simulation-based model-fitting strategies.

4. Prerequisites / Co-requisites (use quarter and semester codes):
   Quarter codes: Statistical Theory (Stat 520/521, or Stat 610/623, or Stat 621/622) and Applied Regression Analysis (Stat 645) or written permission of the instructor.
   Semester codes:
   Stats Theory - Stat 6301 and concurrent registration in Stat 6302 or Stat 6801 and concurrent registration in Stat 6802
   and
   Regression - Stat 6450 or concurrent registration in Stat 6950 or written permission of the instructor.

5. Exclusions (use quarter and semester codes):
   None.

6. A list of topics that make up the course: (One per line, max of 15 topics -- if you course description is a list of topics, I can just use that list)
   1 Compound decision problem (empirical Bayes problem)
   2 The hierarchical model
   3 Comparison of models
   4 Model diagnostics
   5 Construction of prior distributions
   6 Models for discrete data
   7 Combining disparate sources of information

7. Does your class have a component that is not just a lecture (YES/NO):
   NO

8. If your course is not a straight conversion and adds or removes material, write a brief rationale for the change (one sentence - max 250 characters).
Applied Bayesian Methods

Year 1, second half of spring semester, 2 credits

Rough coverage to include
- Compound decision problem (empirical Bayes problem)
- Hierarchical model for normal means
- Hierarchical model for a collection of regressions
- Comparison of models (Bayes factor, conditional predictive ordinate, others)
- Diagnostics (focus on predictive diagnostics)
- Elicitation/construction of prior distributions
- Models for discrete data (Bernoulli, binomial, multinomial, Poisson)
- Combining very disparate sources of information

Target audience: Our own PhD students

To fit the models to data, one would need to have some practical ability to use MCMC methods--hence enough theory to compute a few conditional distributions (or to follow the calculations), and enough computational skill to write/modify functions to implement Gibbs steps or Metropolis-Hastings steps. An additional requirement is familiarity with concepts and models from the design and regression courses.

10/15/10
In light of faculty discussion at the curriculum meeting this week, we now add the second-year MAS students to the target audience.