# SCHEDULE and AGENDA

**Session 1:** Introduction to R: Reading data into R; R commands to summarize and graph and for analyzing relationships; Exploring the robustness of the t-statistic; Writing a function to compute the t-statistic; Programming a Monte Carlo simulation; Differing behavior of the true significance level under varying assumptions.

**Session 2:** Introduction to Bayesian Concepts: Prediction; Dealing with proportions; Discrete priors; Beta priors; Histogram priors.

**Session 3:** Single-Parameter Models: Normal distributions with known means and unknown variance; Estimating a heart transplant mortality rate; Bayesian robustness; Mixtures of conjugate priors; Example: Fairness of a Coin Toss.

**Session 4:** Multiparameter Models: Normal data with both parameters unknown; Multinomial models; Comparing two proportions; A Bioassay experiment.

**Session 5:** Bayesian Computation: Computing integrals; Framing a problem in R; A beta-binomial model for overidspersion; Approximations based on posterior modes; Monte Carlo method for computing integrals; Rejection and importance sampling; Using a multivariate t as a proposal density; Sampling important resampling.

**Session 6:** Hierarchical Modeling, three examples; Individual and combined estimates; Examining mortality rates; Modeling a prior belief of exchangeability; Posterior distribution and simulating from the posterior; Posterior influences; Bayesian sensitivity analysis; Posterior predictive model checking.

**Session 7:** Model Comparison: Comparing hypotheses; One-sided and two-sided tests of a normal mean; Comparing two models; Models for soccer goals; The 'streakiness' of a baseball hitter; Test of independence in a two-way contingency table.

**Session 8:** Regression Models: Normal linear regression; The model; the posterior distribution; Prediction of future observations; Model selection using Zellner's prior; Survival modeling.