

Probability and Statistics II

Stat 111: Thursday 1:15-4:30pm in SC 149
Swarthmore College, Spring 2011

Professor: Phil Everson

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web page: <http://www.swarthmore.edu/NatSci/peverso1/stat111.htm>

Office Hours: Tuesday, 2:30 - 4:30pm, Wednesday, 9:30-11:30am (2:00-4:00pm),
and **by appointment** (email me or ask after class.)

Primary Text: *Mathematical Statistics and Data Analysis*, by John A. Rice.

Course Description: Stat 111 is a continuation of Stat 61 and will review and embellish, in seminar format, much of the same material. Individual presenters may be asked to do additional readings from texts other than Rice. In particular, we will talk more about the Bayesian approach to statistical inference. We will also make use of the statistical program R, a free program available for download and available on the math-lab computers.

Tentative Schedule of Topics

- week 1: Review of discrete probability.
- week 2: Review of continuous random variables and transformations.
- week 3: Jacobian, Covariance and the CLT.
- week 4: Likelihood, Sufficiency and Information.
- week 5: Hypothesis tests: significance level and power.
- week 6: More classical inference.
- week 7: Linear Regression.
- week 8: Multiple Regression Model
- week 9: Inference for Regression
- week 10: Normal Hierarchical Model and Regression
- week 11: Empirical Bayes for Hierarchical Models
- week 12: Jeffreys' Prior and Posterior Inference
- week 13: Methods for Posterior Simulation
- week 14: Bayesian Inference for the Normal Hierarchical Model.

You are expected to attend and participate in all fourteen sessions. Each week, two or three students will be assigned to give presentations. These students should arrange meetings with me for earlier in the week, and start thinking about the problems before we talk. There will also be problems for everyone to turn in each week, and a take-home final that you may work on for three days during the reading and finals period (times to be arranged with me).