

**ST 790R: Computer Intensive Methods**  
(to become ST758: Statistical Computing for Research)  
**Fall 2009**  
**Syllabus**

Time: Tuesday and Thursday, 8:30-9:45 am  
SAS Hall, Room 5270

Texts: Monahan, John F., *Numerical Methods of Statistics*, Cambridge Univ. Press (2001)

and a manual on R:

<http://cran.r-project.org/doc/manuals/R-intro.html>

Tentative Schedule of Topics with time allocation -- ~15 weeks, 28 sessions.

- 1) Algorithms, Software, & Hidden Operations (3)
- 2) R and programming practice (3)
- 3) Matrices and Solving Linear Equations (3)
- 4) Regression Computations (2)
- 5) Nonlinear equations, optimization (2)
- 6) Maximum likelihood, EM, and Nonlinear Regression (4)
- 7) Numerical Integration and Monte Carlo (2)
- 8) Principles of a Simulation Experiment (4)
- 9) Generation from Various Distributions (2)
- 10) Resampling Methods (3)

This course is designed to prepare graduate students for numerical work in research in statistics and related areas. The computing language used in this course will be R. Approximately eight homeworks will be assigned involving both analysis and computation. One of those homeworks will be a project involving a simulation experiment which will carry twice the weight of other homework assignments. The final exam will involve computation and will be weighted as another homework. Letter grades will be assigned. The prerequisite for this course is ST552 Linear Models (and its pre- and co-requisites: MA 405 (Linear Algebra), ST 521-522).

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Homeworks are considered late if not received before I leave for the day. Late homeworks are accepted subject to discounting.

I expect students to attend class, but I will not take attendance.