

ST 610 I, Fall 2005

Introduction to Statistical Computing

Instructor:

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Office Hours: By appointment.

Course prerequisites:

ST 512

Textbook:

No book is required. We will post the notes on the webpage for the course.

Schedule:

Monday 4:30-5:20pm, Harrelson G100.

HomeWork:

There will be some in-class assignments, and also some recommended home assignments.

Lecture Notes:

Lecture notes and handouts will be available on the web, or they will be handed in class.

Exams:

No exams. The grade will be based on attendance and participation in class.

Grading:

One-credit, S/U course.

Objectives:

The main objective of this course is to introduce students to the R data analysis and graphics package. This course will be an opportunity to learn how to write and debug in an efficient way your own functions in R. We will introduce efficient programming through examples, and there will be an emphasis on how to run efficient simulation studies.

More specifically, we will cover the following topics:

R:

- Introduction to R Getting started (August 22)
- Objects Vectors, matrices, lists (August 29)
- I/O subsetting datasets (September 12)
- Plotting basics, sourcing a program (September 19)
- High level Graphics functions, putting several plots on a page (September 19)
- Writing your own functions (September 26)
- A Matrix Language, Simulation (September 26)
- Fitting Linear Statistical Models (October 3)
- Calling FORTRAN, UNIX and R functions (October 3)
- R and the emacs editor: R-mode (October 10)
- Debugging in R (October 17)
- How to write a good (efficient) R code using vectorized arithmetic. (October 24)
- Simulations (October 31)
- Maps and images (November 7)

Additional lectures:

- High level graphics and mapping using ArcView GIS (November 14).
- Since how to run a good simulation study is such an important topic. Apart from covering it in R. Joy Smith will come to the class to explain how to run a good simulation study using a SAS framework. Joy Smith will come to talk about simulations and storage of data sets in SAS on November 21 and November 28.