Fall 2013
Stat 8003: Statistical Methods I
Syllabus

Aug. 29, 2013

Basic Info

Time: Thursday, 5:30pm – 8:00pm
Location: Alter Hall A746
Instructor: Jichun Xie, Ph.D.
Email: `jichun@temple.edu`
Office: Speakman Hall 333
Phone: 215-204-4275
Office Hour: Friday, 9:00am-11:00am
Course Webpage: `https://blackboard.temple.edu`

Prerequisites

A prior course in statistics, essentially the standard intermediate undergraduate course that is part of most undergraduate programs (such as Stat 2512 at Temple), is a prerequisite for Stat 8003. Students enrolled are expected to know algebra, elementary differential calculus (including using derivatives to find maxima and minima and Taylor expansion), elementary matrix operations (including eigenvalues and eigenvectors), the definition of random variable, probability and distribution. If not, the students are expected to be willing to take extra time in the beginning of Stat 8003 to acquire additional background.

Email

I am usually available by email at `jichun@temple.edu`. This is the best way to reach me. Please indicate [Stat 8003] in the subject line.

Homework

Homework will be assigned at the beginning of the class, and is due at the time of the next class. No late homework will be accepted unless it is due to some excused absence.

Exams

There will be an in-class close-book mid-term exams and a take-home final exam. Tentative dates are listed on the schedule. Students must work individually in the exams. No makeup tests and/or exams are allowed for missed exams.

If you have a disability for which you are or may be requesting an extension, you are encouraged to contact both your instructors and Disability Resource and Services at Temple (215-204-1280) in the beginning of the semester. If I am not informed before Sep. 6, 2012, no extensions will be made for the exams.

Grade Calculation

The weighting factors are as follows: Midterm, 30%; final, 40%; homework, 30%. Class participation that advances the aims of the course is encouraged and may enter into the calculation of your course grade.

Software

We will primarily use R/S-PLUS as the computing language in the class. R is an open-source free software available online. You can download it from `http://www.r-project.org/`. The S-PLUS student edition is available free to students at Temple for their personal machines. Please check the Temple Computer Service website `http://www.temple.edu/cs/`. Both R and S-PLUS are installed on all machines in Speakman and Alter Hall.

For editing, we will discuss LaTeX in the first class. All homework and take-home exam are required to be edited by LaTeX.

Blackboard

All course documents will be placed on Blackboard `https://blackboard.temple.edu`. You are responsible for checking Blackboard frequently for course announcements and course documents. In addition, I may broadcast e-mail messages to the class. You need to make sure that your e-mail address known to Blackboard is the one you check frequently. If not, please forward your Temple email to the other address you use by the following instructions at the gmail help page `http://mail.google.com/support/bin/answer.py?hl=en&answer=10957`.

Textbook and Other References

[1] John Rice. *Mathematical Statistics and Data Analysis (Third Edition)*. Cengage Learning, 2007.

[2] Ronald R. Hocking. *Methods and Applications of Linear Models: Regression and the Analysis of Variance*. A Wiley-Interscience Publication. John Wiley & Sons, Inc.

[3] Charles E. McCulloch and Shayle R. Searle. *Generalized, Linear and Mixed Models*. A Wiley-Interscie nce Publication. John Wiley & Sons, Inc.

[4] Nalini Ravishanker and Dipak K. Dey. *A First Course in Linear Model Theory*. Chapman & Hall/CRC.

[5] *An Introduction to R*. `http://cran.r-project.org/doc/manuals/R-intro.html#Top`.

Topics and Schedule

The tentative topics include introduction to data, graphs, R software, and basic statistical inference and methods for linear models, including comparing the mean of two populations, least square regression and testing contrasts, *etc.*.

1	Thu	Aug.	29	Introduction to the course, Introduction to LaTeX
2	Thu	Sep.	5	Introduction to LaTeX, Introduction to R
xxx	Mon		9	Last day to drop a class
xxx	Thu		12	Class changed to Sep. 13 12p-2:20p
3	Fri		13	Random Variable, Probability, Distribution, and their Graph Display
4	Thu		19	Multivariate RV and Distribution, Introduction to Estimation, Expectation, Median, Variance, and Moments
5	Thu		26	Parameter Estimation, Method of Moments, Maximum Likelihood Estimation
6	Thu	Oct.	3	Confidence Interval
7	Thu		10	Hypothesis Testing
8	Thu		17	Mid-term Exam, (Generalized) Likelihood Ratio Test
xxx	Tue		22	Last day to withdraw from a course
9	Thu		24	Hypothesis Testing
10	Thu		31	Wald Test, Score Test, Normal Test and Design, Sample Size and Power Based on Normal Test
11	Thu	Nov.	7	Introduction to Linear Regression, Least-Square Estimators
12	Thu		14	Multiple Linear Regression, Link between MLR and SLR
13	Thu		21	Inference about Linear Model
14	Tue		26	Inference about Linear Model