

**Time:** MWF (8th periods starting at 3:00)

**Place:** FLO 230.

**Course description:** The goal of this course is to cover matrix algebra and two of most popular computational languages in statistics. It will serve as a foundation for other statistics classes. The main topics are: 1) Matrix algebra, 2) computational language SAS/IML, R (S-plus) and computing skills that are most relevant to statistics.

**Prerequisites:** MAC3313 (Calculus III, high-dimensional calculus including partial differentiation and multiple integrals),

**Text:** David A. Harville, *Matrix Algebra from a Statistician's Perspective*, Springer, 1997.

The notes for R can be found in <http://www.stat.ufl.edu/~yang/STA6329/R/>.

The notes for SAS can be found at <http://www.stat.ufl.edu/~yang/STA6329/SAS/>.

### **Tentative Coverage Schedule:**

The Mondays and Wednesdays are for lectures in matrix algebra and the Fridays are for R and SAS.

The matrix algebra will cover:

Basic operation in matrices (Ch. 1-2 of Hraville's book), linear independence and rank (Ch. 3-4), linear system (Ch. 5-7), inverse and g-inverse (Ch. 8-9), idempotent matrix and projections (Ch 10-12), Determinant (Ch. 13), quadratic forms (Ch. 14) and eigenvalues and eigenvectors (Ch. 21). Chapters 15 (matrix differentiation) and 16 (Kronecker products) will be covered if time permits.

The coverage of R will be 4 hours. Please also refer to the website mentioned above (click on lesson1.htm to see the contents of lesson 1, etc.)

The coverage of SAS will be 9 hours with emphasis on data management and SAS programming language (MACRO and IML). Some statistical procedures will be used. Please refer to the website mentioned above.

**Grading:** Homework including matrix algebra and programming (40%) (They will be assigned weekly on Friday and collected on the following Wednesday, except holidays. According to the university honor code, the homework should be done by the student him/herself. Discussion is fine, but not copying.) First exam (September 30 (Wed), two hours\*, 20%), the second exam (Nov.4 (Wed), two hours\*, 20%) and the final exam (Dec. 9 (Wed), 2 hours. 20%). A review sheet will be handed out one week before the

exams. Tentative letter grades division:  $85\%^+ = A$ ,  $75\%^+ = B^+$ ,  $65\%^+ = B$ .

\* I intend to make them two hour exams, from 3:00-5:00, depending on whether there are class conflicts among the students. The class on Nov. 14 is canceled.

**Instructor: Mark C. K. Yang**, Room 202 Griffin-Floyd Hall, Tel: 273-2979, Office Hours: MWF : 5:10pm - 6:10pm, e-mail: yang@stat.ufl.edu. His background and publications can be found from his website.

**T.A.:** Mr. Yuan Liao, Room 218, FLO. Office hours: Tuesday and Thursday 9:30pm - 11:30pm.