COURSE INFORMATION
Statistics 5401/8401
Fall 2002

Time/place:	10:10-11:00 MWF, Ford 115, Mpls Campus
Instructor:	Gary W. Oehlert
	313B Ford
	625-1557
	gary@stat.umn.edu
Office Hours:	11:00-12:00 MWF, and by appointment
Texts:	Johnson and Wichern (2002) *Applied Multivariate Statistical Analysis* (required)
	Bingham & Oehlert, *An Introduction to MacAnova* (optional, available from web)
	Oehlert & Bingham, *MacAnova User's Guide v4.07* (optional, available from web)
Class Home Page:	`http://www.stat.umn.edu/~gary/classes/5401`
Grader:	Radu Lazar
	lazar@stat.umn.edu
	office hours TBA

Organization

This course is listed as both 5401 and 8401. The difference between the two is that those registered for 8401 will do an additional project, which includes both a written component, and a 25 minute oral presentation to the class near the end of the semester. Students in 8401 should see me by the third week of class to choose a project topic.

The remaining portions of the course are reading, lectures, homework, and exams. There will be reading assignments from Johnson and Wichern every week, and you should read the material before the corresponding lectures. My lectures may not cover everything in the readings, and will likely cover topics not in the readings.

There will be homework assignments more or less every week. A subset of the homework will be graded, and late homework may not be graded. Working together on the homework is acceptable, as it can be a good way to learn the material, but your should write on your homework telling us with whom you worked. Every student should write up his or her own solutions, and in no case is simply copying someone else's work acceptable.

Part of the grade for homework is for organization and presentation of ideas. In particular, do not simply include a slug of unannotated computer output; that will obtain little credit. Include only the relevant output and comment about what the output tells you. Use informative labels on plots. The goal is like a report to coworkers; you don't have to teach us what you've done, but you do need to tell us what you've done, why you did it, and what it means. We can't read your mind.

There will be one midterm exam and one take-home final exam. The mid-term is scheduled for October 18. The take-home final will be due the last day of classes.

Course Grade:

	5401	8401
Homework	30%	25%
Project	0%	20%
Mid-term exams	30%	30%
Final exam	40%	25%

Computing

You can't really get anywhere in multivariate analysis without software to do the crunching. I will be demonstrating with the MacAnova program, which is freely available for Macintosh, Windows, and Linux. The advantages of MacAnova are that it's free, it does what we need, and it's reasonably easy to get up and running and do the easy stuff. The major disadvantage of MacAnova is that it's not SAS (or whatever the favorite package is in your discipline).

I recommend that you use MacAnova. If you wish to use some other program (e.g. SAS), you may do so, but I will not be able to help you if you run into problems, and you will have the additional burdens of making sure that you know what your program is doing and telling me in the homework and exams.

One thing to watch out for is this. Lot's of other programs will do standard analyses, many of them quite nicely too. However, many of these programs wrap all the steps up into a big black box with a button on top that you push. It makes the sausages, and then prints them out. This is fine as long as the black box does exactly what you want done. But in this course, you will need to be able to do some of the individual steps that may not be easily available in the more black box sorts of packages (for example, some of the matrix algebra, or simulate the null distribution of a test statistic under nonstandard assumptions).

The MacAnova home page is `http://www.stat.umn.edu/macanova/`. There you will find links to download the software and documentation. Both MacAnova documents listed as optional texts above are available for free over the Web from the homepage. These files are in Acrobat format; you can get an Acrobat reader for free from `http://www.adobe.com`. The User's Guide is more detailed but less up-to-date. The internal help in MacAnova is also available on the Web.

Handouts

Handouts, assignments, and so on will be available on the class web page, so you can get any you missed there.

Structure

This is my first time teaching 5401, so I'll be working to keep a step ahead of you. Prof. Bingham has taught this course in the past, and I will more or less follow his course outline. Even with that, exact topics and timing are a bit hazy near the end.

This material is available in alternative formats upon request. Please contact Dana Tinsley, School of Statistics, Ford 313, 625-7300.

Date	Topic	Chapter in Text
S 4	Introduction	1
S 6	Matrix Fundamentals	2
S 9	Graphical Display	1
S 11	Matrix Manipulation	2
S 13	Vectors and Geometry	2
S 16	Quadratic Forms and Eigenstructure	2
S 18	Means and Variances	3
S 20	Multivariate Normal Distribution	4
S 23	Assessing Normality	4
S 25	Wishart Distribution and T^2	5
S 27	More T^2 and Multiple Testing	5
S 30	Profile Analysis	6
O 2	Univariate Linear Models	
O 4	Multivariate Linear Models	6
O 7	Multivariate Linear Hypotheses	6
O 9	Testing Multivariate Hypotheses	6
O 11	Testing Multivariate Hypotheses	6
O 14	Canonical Variates	6
O 16	Repeated Measures	6
O 18	Midterm exam	
O 21	Principal Components and the SVD	8
O 23	Data and the Biplot	8
O 25	Inference	8
O 28	Factor Analysis	9
O 30	Factor Analysis	9
N 1	Factor Analysis	9
N 4	Factor Analysis	9
N 6	Canonical Correlations	10
N 8	Canonical Correlations	10
N 11	Classification	11
N 13	Classification	11
N 15	Classification	11
N 18	Classification	11
N 20	Clustering	12
N 22	Clustering	12
N 25	Clustering	12
N 27	Clustering	12
N 29	Thanksgiving Holiday	
D 2	Catch up/extra topics	
D 4	Catch up/extra topics	
D 6	Project reports	
D 9	Project reports	
D 11	Project reports	
D 13	Project reports	