Math 314/814 - Matrix Theory Oldfather Hall room 304, 11:00-12:15 TR **Spring 2005**

This syllabus shows the material expected to be covered and the corresponding suggested problems for each week. Prior to each class you should determine what is to be covered and read the relevant material in the book. As soon as the material is covered in class, you should work the assigned problems (if not also additional ones!).
Much of what is shown here is tentative; there may be changes, which will be announced in class. Unlike the other exams however, the time and date of the final exam is not tentative and cannot be changed. The final exam is comprehensive and everyone is required to take it. You must arrange your personal and work schedules to allow you to take the exam at the scheduled time.

Week	Sec. #	Topics	Exercises	Week of
1	1.1	Systems of linear equations	1,11,13,15,17,21,25,27,29	Jan. 10
	1.2	Row reduction and echelon forms	1,6,9,13,15,19,21,23,25,27,29	
	1.3	Vector equations	1,5,9,12,13,17,21,25,26	
Monday, Jan. 17 – Martin Luther King, Jr. Day			No class on Mon, Jan. 17	
2	1.4	The matrix equation $A\mathbf{x} = \mathbf{b}$	1,6,7,12,14,15,22,23,25,38	Jan. 17
	1.5	Solution sets of linear systems	1,6,12,13,17,24,34,35,36	
	1.7	Linear independence	1,5,8,11,14,22,30,31,33,34,38,39	
Fri, Jan. 21 — last day to drop a course without a grade of 'W'				
3	1.8	Introduction to linear transformations	1,4,9,11,20,22,25,28,30,31,32,34	Jan. 24
	1.9	The matrix of a linear transformation	1,4,8,13,15,17,22,24,25,33,35	
	1.10	Linear models, Applications		
	2.1	Matrix operations	2,3,9,10,13,15,19,21,23	
4	2.2	The inverse of a matrix	2,3,6,9,14,15,17,19,22,25,35,37	Jan. 31
	2.3	Characterizations of invertible matrices	1,4,8,11,14,21,22,23,24,25,27,28	
	3.1	Introduction to determinants	1,3,9,19,21,38	
5	3.2	Properties of determinants	1,5,11,15,19,21,28,29,31,34,43	Feb. 7
	3.3	Cramer's Rule, Volume	11,17,18,19,20,29,31	
6		**Tentative day for EXAM I**		**Feb. 15**
	4.1	Vector Spaces and subspaces	1-12,15,16,19,21,23	
		(We'll refer to 2.8 & 2.9 as we cover Ch 4.)	(2.8: 1,4,5,6)	
	4.2	Null spaces, Column spaces	1,6,7,9,10,17,25-28,30,32	
			(2.8: 7,9,11,13)	
7	4.3	Linearly independent sets; Bases	1,4,10,11,13,15,21,24,25,29,31,32	Feb. 21
			(2.8: 16,17,19,21,24)	
	4.4	Coordinate systems	1,8,9,11,13,14,16,17,19,22,23,27	
8	4.5	The dimension of a vector space	2,5,7,11,13,19,21,23,25,27,29,31	Feb. 28
	4.6	Rank	1,5,9,11,12,18,19,25,30,31,32	
	4.7	Change of basis	1,3,5,7,9,11,13,15	
Fri, March 4 — last day to change to or from Pass/No Pass				
9	4.9	Applications to Markov chains	1,2,5,6,7,12,18,19	March 7
	5.1	Eigenvectors and eigenvalues	2,4,9,11,14,20,22,23,24,25,27,31	
March 14 - 18 Spring Break !				
10	5.2	The characteristic equation	1,4,10,15,18,19,20,21,23,24,25	March 21
	5.3	Diagonalization	1,3,6,8,11,12,22,23,25,27,28,29	
11		**Tentative day for EXAM II**		**March 29**
	5.5	Complex eigenvalues (and read Appendix B)	1,4,9,11,13,21,23,24,25	
	5.6	Discrete dynamical systems	1,3,5,7,9,11,15	
12	6.1	Inner product, length and orthogonality	2,3,7,9,16,19,24,25,27,28,30	April 4
	6.2	Orthogonal sets	1,7,11,12,15,17,21,23,27,29,31	
Fri, April 8 — Last day to withdraw from a course				
13	6.3	Orthogonal projections	1,3,7,11,13,15,21,23	April 11
	6.4	The Gram-Schmidt process	3,7,9,11	
14	6.5	Least-squares problems	3,5,9,13,18,19,20,24	April 18
	6.6	Linear Models	1,7,9,10,15,16	
Project Due Date – April 20				
15		Review, Catch-Up and/or Optional Topics		April 25

Final Exam (held in usual classroom): will be announced later

Important Dates:

Jan 21, friday	Last day to drop without W
Feb 14, monday	TEST 1
March 4, friday	Last day for changing P/NP
March 28, monday	TEST 2
April 8, friday	Last day to withdraw with W
May 6, friday	FINAL EXAM, 10: - 12noon

Department Grading Appeals Policy The Department of Mathematics and Statistics does not tolerate discrimination or harassment on the basis of race, gender, religion, or sexual orientation. If you believe you have been subject to such discrimination or harassment, in this or any other math course, please contact the department. If, for this or any other reason, you believe your grade was assigned incorrectly or capriciously, then appeals may be made to (in order) the instructor, the department chair, the department grading appeals committee, the college grading appeals committee, and the university grading appeals committee.