NUMERICAL METHODS AND LINEAR ALGEBRA
Math 2890 Syllabus Spring 2008

Space-Time: UH 4440 MWF 9-9:50am

Instructor: Mao-Pei Tsui

Office Hours: UH2080B M 10:00-11:00am, W 2:00-4:00pm, F 10:00-11:00am

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Homepage: http://www.math.utoledo.edu/∼mtsui/

Class Web Site: http://www.math.utoledo.edu/∼mtsui/2890sp08/2890.html

Text: *David C. Lay, Linear Algebras and its Applications, third edition SBN-10: 0201709708*

Prerequisites: MATH 1830, 1850 or 1920

Homework: Typically, homework will be assigned weekly and collected at the beginning of the class on the due date. Assignments and their due dates will be posted on this course website. Late assignments will not be accepted unless in extraordinary circumstances. Your solutions must be neat and show all work. If you do not show your work then you will not receive credit for your solution. I will drop your two lowest homework scores.

Quizzes: Throughout the semester, there will be several 15 minute quizzes given during class, the dates to be announced in advance. The material in the quizzes will be drawn from the homework and suggested problems selected for the previous week. The lowest quiz score will be dropped.

Exams: We will have two in-class one hour midterm exams, and a two hour final exam.

- Midterm I Feb. 11 (Monday)
- Midterm II Mar. 24 (Monday)
- Final Exam April 29(Tuesday), 10:15-12:15

The final exam is comprehensive and will slightly place more emphasis on the material covered after the last in-class exam.

Missed Quizzes and Exams: Absences for quizzes and exams can only be excused if covered by the University's missed class policy. The policy specifically mentions absences from class may be excused for personal emergencies, religious observances, participation in certain UT sponsored activities, and government required activities. For more information see http://www.utoledo.edu/index.asp?id=529. Arrangements for make up quizzes and exams will only be made if you inform me of the absence without delay by phone or email and present a documented excuse.

Grading: The following percentages are assigned to the components of the student's grade.

Quizzes	10%
Hand in homework	15%
Exam I	20%
Exam II	20%
Final Exam	35%

In computing the quiz grade the lowest quiz score will be dropped.

Your final grade will be determined from the distribution of total points earned, on the following scale: 90-100% earns an A; 80-89% earns a B; 70-79% earns a C; 60-69% earns a D. The IW grade will be given to only those students who have stopped attending class before or on March 24. If you have any question about your grade at any time please speak with me.

Resources: There are resources available for students who need extra help outside of my office hours. For this courses the most reliable source of tutorial help can be found at the Mathematics Learning and Resource Center located in the basement of Carlson Library(adjacent computer lab).

Goals:

At the end of the course, students should be able to

• make calculations with agility, accuracy, intelligence and flexibility

• explain the basic concepts clearly and reason logically with them.

Expectations :

To achieve these goals, students are expected to

• read each section of the textbook before the material is presented in class

• attend the lectures

• complete all homework assignments

• discuss mathematics with other students and the instructor

Calendar:

Martin Luther King Day	January 21
Last date to drop	January 22
Exam I	Feb. 11 (Monday)
Spring Break	Mar. 3 - Mar. 7
Last date to withdraw	Mar. 21 (Friday)
Exam II	Mar. 24 (Monday)
Final exam	April 29(Tuesday), 10:15-12:15

Course outline: This is a course in numerical methods in linear algebra. The focus of the course is on matrix factorizations and the algorithms used to find them. The use of the computer program Matlab is an integrated part of this course. This is brief outline of the sections covered from the textbook:

• Chapter 1, sections 1.1-1.5, 1.7, 1.8: linear systems, row reductions, vector equation, matrix equations, solution sets, linear independence, linear transformations

• Chapter 2, sections 2.1-2.5, 2.8, 2.9: matrix operation, matrix inverse, invertible matrices, partitioned matrices, matrix factorization, subspaces of R^n, dimension and rank;

• Chapter 5, sections 5.1-5.3, 5.8: eigenvectors, eigenvalues, characteristic equation, diagonalization, iterative methods;

• Chapter 6, sections 6.1-6.5: inner products, orthogonal sets, orthogonal projections, Gram-Schmidt orthogonalization process, the method of least squares;

• Chapter 7, sections 7.1-7.2, 7.4: diagonalization of symmetric matrices, quadratic forms, singular value decomposition