Math 340, Elementary Matrix and Linear Algebra

Fall 2015

Prerequisites: Math 234 or Math 222 and 240.

Class:
VAN VLECK B239, 1:00 PM - 2:15 PM, TR.

Professor: Bing Wang, Department of Mathematics,
Office Hours in Van Vleck 813, MW 1:00-2:00pm or by appointment,

Grade:
Your overall score will be calculated according to the following categories and weights.

- **Midterm Exams (15% × 3): Oct 1st, Oct 22nd, and Nov 19th.** All the midterm exams are in the Thursday class. Every midterm exam is NOT accumulative.

- **Final Exam (35%): Monday, Dec 21st, 12:25pm-2:25pm, place to be determined.** Final exam is accumulative.

- **Quizzes (20%):** There will be quizzes during discussion section meetings, given by your TA.

You will be graded on a curve. First, an auxiliary curve will be obtained based on the midterm and the final exams. Second, from the auxiliary curve, we figure out the distribution of each grade in every TA’s sections. Third, based on this distribution and the ranking of students’ total scores in each TA’s sections, we assign the final grade. In this way, the effect of the TA difference can be minimized. Students from different TA sections can be compared fairly.

I list homework problems on my website. The homework problems will NOT be graded. However, they are the prototypes of the Quiz problems and many exam problems. So make sure to finish them all.

Attention:

- Acceptable excuses for missing an exam include only official university excuses, with a note from an appropriate university official.

- If you have special exam requirement, please contact your TA as early as possible. We need extra time to find place and people to proctor the special exams.
• Cheating formula sheet, Calculators and computer software are NOT PERMITTED during exams and Quizzes. If you engage in any misconduct during the exam, your exam score will automatically be zero.

Course Content:
Math 340 is our standard Linear algebra course for non math majors. Math majors are also allowed to take Math 340 for their requirements, although the more theoretical, proof-based Math 341 is recommended in their case. Math 340 covers the principles of linear algebra and the theory of matrices with an emphasis in understanding the concepts and being able to perform calculations. Some proofs are also introduced in Math 340. The course will cover

• **Linear Equations and Matrices:** Matrix algebra, Elementary matrices, Row operations, Inverses, Echelon form, Gauss-Jordan elimination.

• **Real Vector Spaces:** Vector space axioms, Subspaces, Span and linear independence, Basis and dimension, Rank of a matrix, Coordinate vectors.

• **Linear Transformations and Matrices:** Kernel and range, Isomorphisms, Matrix of a linear transformation, Similarity and change of basis.

• **Determinants:** Odd and even permutations, Computation by row and column operations, Cofactor expansions, Cramer’s rule, Inverses of matrices and nonsingularity via determinants.

• **Eigenvalues and Eigenvectors:** Definitions, Diagonalization, Symmetric matrices.

• **Inner Product Spaces:** Cauchy-Schwarz inequality, Angle between vectors, Gram-Schmidt process.

Textbook:
*Elementary Linear Algebra with applications*, by Bernard Kolman and David R. Hill, ninth edition.