

**MA 405-001
COURSE SYLLABUS**

**Department of Mathematics
North Carolina State University
Summer I, 2004**

Instructor Information:

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Office Hour: Tuesday, Wednesday and Thursday 10:30-11:30

Goal & Objective:

This is the first course in Linear algebra and matrices. The course will start with solving linear systems using Gauss elimination. Students will be introduced to basic concepts such as vector spaces, linear independence, bases, dimension, orthogonality, eigenvalues, reduction of matrices to diagonal forms. At the end of the course students will master the basic concepts of linear algebra and matrices to apply elsewhere.

Text Book:

1. Linear Algebra with Applications, (sixth edition), by S. Leon

Topics to be covered with estimated time:

Linear systems, Gauss elimination, Row-Echelon Form, homogeneous and nonhomogeneous systems, Matrix algebra, elementary matrices, matrix inversions, LU factorization (Chap. 1), (4 lectures)

Determinants and their properties, (Chap. 2), (2 lectures)

Vector spaces, subspaces, linear independence, basis, dimensions, change of basis, row and column spaces, (Chap.3), (5 lectures)

Linear transformations, matrix representations of linear transformations, similarity, (Chap. 4), (2 lectures)

Scalar product, orthogonal subspaces, orthonormal basis, Gram-schmidt procedure, QR decomposition and Least square solutions (Chap. 5) (2 lectures)

Eigenvalues and eigenvectors, diagonalization, Hermitian matrices (Chap. 6), (3 lectures)

Test dates and Grading Policy:

There will be three in-class mid-session tests (Test 1: June 2; Test 2: June 11; and Test 3: June 22) and a cumulative Final examination on June 28(1:00-4:00). Homework will be assigned after each lecture. It is extremely important that you do the homework problems in a timely manner. We will go over selected homework problems as time permits. The in-class mid-session tests will count 66%, Final exam will count 34% of the course grade. Plus/minus grades will be used. Make-up may be given for in-class mid-session tests for very good documented reasons with prior permission. It is very important that you attend each class and take the tests on scheduled dates. Attendance will be used in boarder line cases.

Other Remarks:

Credit is not allowed for both MA 305 and MA 405.

Prerequisite: Preq: MA 241, Coreq: MA 242

Last day to withdraw/drop/change to audit or credit only:

June 8, 2004 (Tuesday).