

**MA 405-001  
COURSE SYLLABUS**

**Department of Mathematics  
North Carolina State University  
Fall, 2003**

**Instructor Information:**

Dr. Kailash C. Misra  
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Office Hour: T, Th 11:15-12:15, W 10:30-11:30

**TA Information:**

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Office Hour: M,W 2:00-3:30

**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 (TTh schedule):**

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-factorization (Chap. 5) (3 lectures)

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

**Test dates and Grading Policy:**

There will be four in-class mid-semester tests (Test 1: Sept. 11; Test 2: Oct. 2; Test 3: Oct. 30 and Test 4: Nov. 20) and a cumulative Final examination on Dec. 16 (1:00-4:00pm). 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 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-semester 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:**

Oct. 1, 2003.