Department of Mathematics  
North Carolina State University  
Fall, 2002

Instructor Information:

Dr. Kailash C. Misra  
Office: HA224  
Office Phone: 515-8784  
Email: misra@math.ncsu.edu  
Office Hour: MWF 11:15-12:15

Goal & Objective:

This is the graduate course in Linear algebra which is part of the Ph.D. qualifying sequence MA520-720 on Linear and Lie algebra. The course will start with basic concepts in vector spaces quickly moving to an in-depth study of linear transformations and their associated matrices. In particular the elementary canonical forms such as rational and Jordan forms will be studied. At the end of the course students will master the important concepts of linear algebra and matrices to be able to take the introductory course in Lie algebras (MA720).

Text Book:

1. Matrix analysis and applied linear algebra, by K. Hoffman and R. Kunze

Topics to be covered:

Vector spaces, subspaces, bases and dimension and related topics (Chap.2)

Linear transformations, isomorphisms, linear functional, double dual and transpose transformation (Chap. 3)

Algebra of polynomials, Lagrange interpolation and polynomial ideals (Chap.4.)

Characteristic polynomials, minimum polynomials, invariant subspaces, simultaneous triangulations and diagonalizations, direct sum decompositions and primary decomposition theorem (Chap. 5)

The rational and Jordan forms (Chap. 7), as time permits

Test dates and Grading Policy:

There will be one in-class mid-semester test, two take-home tests and a cumulative final exam. The dates will be announced in due course. Homework will be assigned
each week. 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 2/3, Final exam will count 1/3 of the course grade. Plus/minus grades will be used. Regular class attendance is strongly recommended. Attendance will be used in boarder line cases.

**Last day to withdraw/drop/change to audit:** October 18, 2002.