

Math 226- Spring 1998-J. Derwent

Texts: Elementary Differential Equations and Boundary Value Problems,
by Boyce and DiPrima, 6th edition, 1997.

Lecture Notes in Linear Algebra, by J. Derwent and A Himonas

First order ordinary differential equations. Linear and nonlinear equations. Separable equations. Applications. Population dynamics. Exact equations. Integrating factors. Homogeneous equations.

Second order equations. Fundamental solutions of the homogeneous equation. Reduction of order. Homogeneous equations with constant coefficients, Undetermined coefficients. Variation of parameters. Free vibrations.

Series solutions. Review of power series. Series solutions near an ordinary point. Singular points. Euler equations. Series solutions near a regular singular point.

Linear algebra. Systems of linear equations. Matrices and matrix algebra. Systems and matrices. Vector spaces, linear independence, bases, dimension. Vector spaces and systems. The dot product and Gram-Schmidt orthogonalization. Linear transformations from \mathbb{R}^n to \mathbb{R}^m . Determinants. Expansion by cofactors. Expansion by row reduction. The adjoint formula for the inverse. Cramer's rule. Introduction to eigenvalues and eigenvectors.

There is written homework for every class, whose aggregate counts the same as one test.

There were also nine Mathematica demonstrations and ten short Mathematica assignments.