

This course covers the basic facts about ordinary differential equations as well as the use of Maple in symbolic and numerical solutions of differential equations.

There are eight homework assignments and eight Maple assignments during the term.

Beginning with the 2003/04 academic year this course will have three lectures each week (in earlier years there were four each week). There are three Maple labs in each of the weeks in which there is a Maple assignment due.

The course is intended for students in the Mathematics and Engineering program and is taken by students in the Engineering Physics program.

Textbook: *Elementary Differential Equations*, 7th Edition
by W. Boyce and R. DiPrima (Wiley)

Prerequisite: APSC-171* and APSC-172* and APSC-174*.

Instructor: D. Offin

Evaluation:	Final Examination	60%
	Term Tests	20%
	Homework	10%
	Maple	10%

Outline:

Linear, exact, and separable first-order differential equation

The existence and uniqueness theorem for
first-order differential equation

Runge-Kutta methods: Euler's method, order, RK4, adaptive methods,
RKF45, DVERK78

Higher-order linear differential equations and undetermined coefficients

Laplace transform, including step functions and convolutions

Solutions of first-order systems of homogeneous differential equations
using eigenvalues, eigenvectors, and generalized eigenvectors

Equilibrium points, phase plots, and stability for 2×2 non-linear
systems of first-order differential equations