Title and Course Number:
   Applied Partial Differential Equations III, MATH 423 $\qquad$ (4-0-4)

Course Description:
   The third course in a three quarter sequence. Applications of linear and weakly non-linear partial differential equations. Analytical solution techniques for parabolic, elliptic, and hyperbolic equations. Green's functions, integral methods, shocks, and the method of characteristics.

Prerequisites: MATH 422

Goals and Objectives: Upon successful completion of this course a student should have a working understanding of:

1. Application of Green's function in the analysis of PDE's.

2. The use of the Method of Characteristics in the solution of PDE's.

Content and Topics:

1. Green's Functions

   (a) Green's Function for time-independent problems (Poisson's equation)
   (b) Fredholm's alternative
   (c) Green's Function for time-dependent problems (wave and heat equations)

2. Method of Characteristics

   (a) Analysis of first order wave-equation via characteristics
   (b) Analysis of the vibrating string problem via characteristics
   (c) Nonlinear problems (shallow water/ Burger's equation)

Computer usage:

Written communication requirements:
   There will be a number of written, in-class exams during the quarter as well as a written final.