MATH 400 (3) Applied Partial Differential Equations
Section 201
Session 2014W, Term 2
(January–April 2015)

Separation of variables, first order equations, Sturm-Liouville theory, integral transform methods.

Prerequisite:
   One of MATH 300, MATH 305 [complex variables, contour integration, residues, branch cuts (and possibly: complex inversion formulas for Fourier and Laplace transforms)] and one of MATH 256, MATH 257, MATH 316 [ODEs, introductory PDEs, separation of variables, Fourier series solutions of PDEs (and possibly: power series solutions of ODEs, Bessel functions, Sturm-Liouville theory)].

Course web page:
   http://www.math.ubc.ca/~nagata/m400/

Recommended textbook (not required)**:**
   Walter A. Strauss, *Partial Differential Equations: An Introduction.*

Additional references:
   R. Haberman, *Applied Partial Differential Equations.*
   Y. Pinchover & J. Rubinstein, *An Introduction to Partial Differential Equations.*
   E. Zauderer, *Partial Differential Equations of Applied Mathematics.*

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Office location, hours:
   Mathematics 112, Tu Th 15:30–17:00

Topics:
   First order equations, characteristics.
   Linear second order equations.
   The wave and diffusion (heat) equations.
   Separation of variables, Sturm-Liouville theory.
   Laplace's equation.
   Eigenfunction expansions, special functions.
   Integral (Fourier and Laplace) transform methods.
   Nonlinear equations [if time permits].

Grading:
   25% Homework
   25% Midterm test
   50% Final examination