

Applied Mathematics 413

Introduction to Partial Differential Equations

(see Course Descriptions for the applicable academic year: <http://www.ucalgary.ca/pubs/calendar/>)

Syllabus

<u>Chapters</u>	<u>Number of Hours</u>
First Order Equations	3
Fourier Series and Integrals	6
The Heat Equation	7
The Potential Equation	6
The Wave Equation	7
Problems in Several Dimensions	7
	TOTAL 36

Course Outcomes

Upon Successful Completion of the Course, Students will be able to:

1. Predict Specific Strategies for solving Linear or Quasi-Linear First Order Partial Differential Equation.
2. Master (and distinguish between) the techniques of obtaining eigenvalues and corresponding eigenfunctions of a Regular, Singular or Periodic Sturm-Liouville System.
3. Express a function of one or two independent variables into a series of orthogonal functions and investigate convergence of the resulting Generalized Fourier Series.
4. Create analogies and observe resemblance concerning Fourier Integrals.
5. Use Fourier Series and Fourier Integrals to obtain solutions to the most frequent equations of Mathematical Physics (Heat , Wave and Laplace Equations) in one or more Space variable and in bounded or unbounded domains.

6. Judge when it is appropriate to choose other coordinate systems (Polar , Cylindrical) or other appropriate techniques (e.g. D'Alembert's Formula) to obtain or analyze results and self-assess the choice made.

Model interdisciplinary applications and make sense of the assumptions used

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2016:08:10

Prerequisite change made 08:07:01

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