
Richard Haberman
Synopsis

Emphasizing the physical interpretation of mathematical solutions, this book introduces applied mathematics while presenting partial differential equations. Topics addressed include heat equation, method of separation of variables, Fourier series, Sturm-Liouville eigenvalue problems, finite difference numerical methods for partial differential equations, nonhomogeneous problems, Green's functions for time-independent problems, infinite domain problems, Green's functions for wave and heat equations, the method of characteristics for linear and quasi-linear wave equations and a brief introduction to Laplace transform solution of partial differential equations. For scientists and engineers.

Book Information

Hardcover: 769 pages
Publisher: Prentice Hall; 4th edition (April 5, 2003)
Language: English
ISBN-10: 0130652431
Product Dimensions: 7.2 x 1.3 x 9.4 inches
Shipping Weight: 2.7 pounds
Average Customer Review: 3.9 out of 5 stars (See all reviews) (27 customer reviews)

Customer Reviews

I used this book for my class in second semester Engineering Math and then liking this book so much I decided to read the other half of the book that my class didn't cover so I'm compelled to write this review as I've pretty much (gladly) covered everything this book has to offer. The first 8 Chapters of this book (my class used) I'll probably summarize as 'Heat and Wave equation' since though going through many different methods, the analysis goes back to those equations. The other half of the book is a bit more interesting but may not be as detailed as the previous chapters. Here I will summarize each chapter:

Ch 1: Heat Equation
Straight forward discussion of physical phenomenon of the diffusion equation in up to 3 dimensions and use of Laplacian in spherical coordinates.

Ch 2: Method of Separation of Variables
The main point of the book in my opinion. Treatment of more physical phenomenon. Laplace's equation with rectangular, circular boundary values.

Ch 3: Fourier

Ch 4: Wave Equation


Ch 5: Sturm-Liouville

Eigenvalue Problems


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