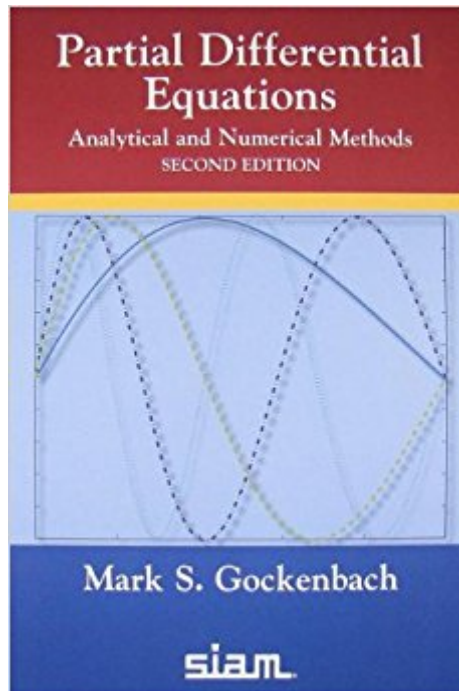


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Partial Differential Equations: Analytical And Numerical Methods, Second Edition



Synopsis

Partial differential equations (PDEs) are essential for modeling many physical phenomena. This undergraduate textbook introduces students to the topic with a unique approach that emphasizes the modern finite element method alongside the classical method of Fourier analysis. Additional features of this new edition include broader coverage of PDE methods and applications, with new chapters on the method of characteristics, Sturm-Liouville problems, and Green's functions, and a new section on the finite difference method for the wave equation. The author continues to emphasize Fourier series and finite element methods, which were the primary scope of the first edition. The book also features emphasis on linear algebra, particularly the idea of best approximation; realistic physical parameters and meaningful experiments for many of the examples and exercises; and tutorials for the most popular software (MATLAB, Mathematica, and Maple) that can be used to reproduce the examples and solve the exercises. Audience: This book is written for undergraduate courses usually titled Introduction to Partial Differential Equations or Fourier Series and Boundary Value Problems. Contents: Preface; Chapter 1: Classification of Differential Equations; Chapter 2: Models in One Dimension; Chapter 3: Essential Linear Algebra; Chapter 4: Essential Ordinary Differential Equations; Chapter 5: Boundary Value Problems in Statics; Chapter 6: Heat Flow and Diffusion; Chapter 7: Waves; Chapter 8: First-Order PDEs and the Method of Characteristics; Chapter 9: Green's Functions; Chapter 10: Sturm-Liouville Eigenvalue Problems; Chapter 11: Problems in Multiple Spatial Dimensions; Chapter 12: More about Fourier Series; Chapter 13: More about Finite Element Methods; Appendix A: Proof of Theorem 3.47; Appendix B: Shifting the Data in Two Dimensions; Bibliography; Index.

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Customer Reviews

I've used this book in several PDE courses aimed at engineers. It's clear, has good problems, and does an excellent job of showing the connections between partial differential equations and linear algebra. Both analytical and numerical methods are developed. I prefer this book to the competitors at this level. The main difficulty I had using this in the classroom isn't the fault of the book. Most of the the students in my classes have been undergrad EE majors, and the book's examples are primarily from mechanics, statics, and heat transfer. The better students had no trouble, but the weaker students wanted some examples more directly connected to what they know.

The book is a great PDE reference guide. I bought the book for class, then discovered we wouldn't be using it much.

pretty good

Product was sent on time in good quality and good condition. I would recommend this to anyone looking to buy books online.

The text arrived before I expected it to. So far, it seems to be a pretty helpful textbook. Explores both traditional and numerical methods for solving PDEs.

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