



Solution Techniques for Elementary Partial Differential Equations (Chapman & Hall/CRC Mathematics)

By Christian Constanda

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Of the many available texts on partial differential equations (PDEs), most are too detailed and voluminous, making them daunting to many students. In sharp contrast, *Solution Techniques for Elementary Partial Differential Equations* is a no-frills treatment that explains completely but succinctly some of the most fundamental solution methods for PDEs.

After a brief review of elementary ODE techniques and discussions on Fourier series and Sturm-Liouville problems, the author introduces the heat, Laplace, and wave equations as mathematical models of physical phenomena. He then presents a number of solution techniques and applies them to specific initial/boundary value problems for these models. Discussion of the general second order linear equation in two independent variables follows, and finally, the method of characteristics and perturbation methods are presented.

Most students seem to like concise, easily digestible explanations and worked examples that let them see the techniques in action. This text offers them both. Ideally suited for independent study and classroom tested with great success, it offers a direct, streamlined route to competence in PDE solution techniques.

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Solution Techniques for Elementary Partial Differential Equations (Chapman & Hall/CRC Mathematics) By Christian Constanda Bibliography

- Sales Rank: #2751521 in Books
- Brand: Brand: Chapman and Hall/CRC
- Published on: 2002-02-26
- Ingredients: Example Ingredients
- Original language: English
- Number of items: 1
- Dimensions: .61" h x 5.96" w x 9.48" l, .86 pounds
- Binding: Paperback
- 272 pages

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Editorial Review

Review

The book contains a large number of worked examples and exercises. ... Useful for the ... student who might be interested ... in learning the manipulating skills of solution methods of first- and second-order partial differential equations.

- Zentralblatt MATH, 1042

Winner of the CHOICE Outstanding Academic Title Award for 2002!

The author, a skilled classroom performer with considerable experience, understands exactly what students want and has given them just that: a textbook that explains the essence of the method briefly and then proceeds to show it in action. In my opinion, this is quite simply the best book of its kind that I have seen thus far. The book not only contains solution methods for some very important classes of PDEs, in easy-to-read format, but is also student-friendly and teacher-friendly at the same time. It is definitely a textbook for adoption.

-Peter Schiavone, Department of Mechanical Engineering, University of Alberta, Canada

...successfully addresses a difficult problem of undergraduate teaching: how to make students understand and become adept at using a class of practical tools that are essential in the study of many mathematical models ... clear, concise, and easy to read --- places the emphasis on worked examples and exercises ... Someone who needs a book that goes straight to the point and shows what partial differential equations are and how they can be solved, should find this textbook to be one of the best suited for the purpose.

- Barbara Bertram, Department of Mathematical Sciences, Michigan Technological University, USA

The study of partial differential equations is of great importance to the scientists and engineers who work with mathematical models. Consequently, it is necessary for these professionals to learn in their formative years how to set up and apply the most suitable methods for solving various types of PDEs. Students in such disciplines who need a book that gives them the required knowledge in an easily understandable, yet rigorous, manner will find Christian Constanda's book an invaluable resource. .. The fact that no computing devices are needed to work through this text is a distinct advantage ... an ideal tool for students taking a first course in PDEs, as well as for the lecturers who teach such courses.

-Dr. Marian Aron, Department of Mathematics and Statistics, Plymouth University, UK

About the Author

Christian Constanda is the Charles W. Oliphant Endowed Chair in Mathematical Sciences in the Department of Mathematical and Computer Sciences at the University of Tulsa. He is also an Emeritus Professor at the University of Strathclyde in Glasgow, UK.

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