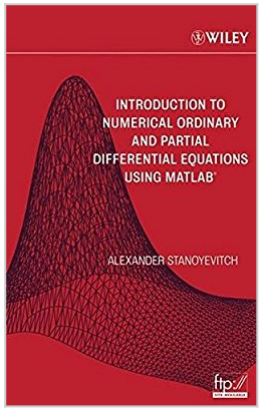

Introduction to Numerical Ordinary and Partial Differential Equations Using MATLAB

By Alexander Stanoyevitch

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Learn how to solve complex differential equations using MATLAB®

Introduction to Numerical Ordinary and Partial Differential Equations Using MATLAB® teaches readers how to numerically solve both ordinary and partial differential equations with ease. This innovative publication brings together a skillful treatment of MATLAB and programming alongside theory and modeling. By presenting these topics in tandem, the author enables and encourages readers to perform their own computer experiments, leading them to a more profound understanding of differential equations.

The text consists of three parts:

- Introduction to MATLAB and numerical preliminaries, which introduces readers to the software and itsgraphical capabilities and shows how to use it to write programs
- Ordinary Differential Equations
- Partial Differential Equations

All the tools needed to master using MATLAB to solve differential equations are provided and include:

- "Exercises for the Reader" that range from routine computations to more advanced conceptual and theoretical questions (solutions appendix included)
- Illustrative examples, provided throughout the text, that demonstrate MATLAB's powerful ability to solve differential equations
- Explanations that are rigorous, yet written in a very accessible, user-friendly style
- Access to an FTP site that includes downloadable files of all the programs developed in the text

This textbook can be tailored for courses in numerical differential equations and numerical analysis as well as traditional courses in ordinary and/or partial differential equations. All the material has been classroom-tested over the course of many years, with the result that any self-learner with an understanding of basic

single-variable calculus can master this topic. Systematic use is made of MATLAB's superb graphical capabilities to display and analyze results. An extensive chapter on the finite element method covers enough practical aspects (including mesh generation) to enable the reader to numerically solve general elliptic boundary value problems. With its thorough coverage of analytic concepts, geometric concepts, programs and algorithms, and applications, this is an unsurpassed pedagogical tool.

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- Sales Rank: #2218290 in Books
- Published on: 2004-12-31

- Original language: English
- Number of items: 1
- Dimensions: 9.37" h x 1.83" w x 6.46" l, .0 pounds
- Binding: Hardcover
- 832 pages

Editorial Review

Review
"…reading it is a pleasure. In summary, here is an excellent, readable introduction to the elementary theory and practice of numerical mathematics." (*CHOICE*, September 2005)

From the Back Cover
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About the Author
ALEXANDER STANOYEVITCH, PhD, is a professor of mathematics and has served as department chairman at the University of Guam. He completed his graduate work in mathematical analysis at the University of Michigan–Ann Arbor. He has published several articles in leading mathematical journals and has been an invited speaker at numerous lectures and conferences. Dr. Stanoyevitch makes extensive use of MATLAB in most of the classes that he teaches.

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