



Numerical Analysis

By L. Ridgway Scott

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Computational science is fundamentally changing how technological questions are addressed. The design of aircraft, automobiles, and even racing sailboats is now done by computational simulation. The mathematical foundation of this new approach is numerical analysis, which studies algorithms for computing expressions defined with real numbers. Emphasizing the theory behind the computation, this book provides a rigorous and self-contained introduction to numerical analysis and presents the advanced mathematics that underpin industrial software, including complete details that are missing from most textbooks.

Using an inquiry-based learning approach, *Numerical Analysis* is written in a narrative style, provides historical background, and includes many of the proofs and technical details in exercises. Students will be able to go beyond an elementary understanding of numerical simulation and develop deep insights into the foundations of the subject. They will no longer have to accept the mathematical gaps that exist in current textbooks. For example, both necessary and sufficient conditions for convergence of basic iterative methods are covered, and proofs are given in full generality, not just based on special cases.

The book is accessible to undergraduate mathematics majors as well as computational scientists wanting to learn the foundations of the subject.

- Presents the mathematical foundations of numerical analysis
- Explains the mathematical details behind simulation software
- Introduces many advanced concepts in modern analysis
- Self-contained and mathematically rigorous
- Contains problems and solutions in each chapter
- Excellent follow-up course to *Principles of Mathematical Analysis* by Rudin

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Editorial Review

Review

"[*Numerical Analysis*] is a solid narrative of mathematical aspects of numerical analysis with an 'inquiry-based' learning method. . . . There are more than 350 frequently challenging exercises that will interest both beginning students and readers with strong mathematical backgrounds."--**Choice**

"A student who picks up this book and works through it systematically will learn a lot of interesting and important mathematics."--**David S. Watkins, SIAM Review**

"Students will be able to go beyond an elementary understanding of numerical simulation and develop deep insights into the foundations of the subject. They will no longer have to accept the mathematical gaps that exist in current textbooks."--**World Book Industry**

From the Back Cover

"Very few modern books can be compared with the present text as an introduction to the mathematical aspects of numerical analysis. This is a very interesting book that can be used not only as a textbook but also as a reference."--**Doron Levy, University of Maryland**

"This is a strong text, one that is both modern and provides historical perspective."--**Benjamin Fearing Akers, University of Illinois at Chicago**

About the Author

L. Ridgway Scott is the Louis Block Professor of Mathematics and Computer Science at the University of Chicago.

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Tom Burkhardt:

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