



An Introduction to C++ and Numerical Methods

By James M. Ortega, Andrew S. Grimshaw



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An Introduction to C++ and Numerical Methods provides a brief yet comprehensive introduction to programming and numerical methods for students in engineering, chemistry, physics, and applied mathematics. It is suitable for second semester or second year students who have had at least a semester of calculus.

This text offers students both an introduction to programming in C++ and clear explanations of the basics of numerical methods, including numerical integration and the solution of ordinary differential equations, nonlinear equations, and systems of linear equations. It is unique among textbooks at this level in its extensive coverage of numerical methods used in scientific and engineering computation.

An Introduction to C++ and Numerical Methods is designed to help students move quickly into writing interesting and sophisticated programs. The text begins with an introduction to scientific computing and the basic constructs of C++, including variables and assignment, typing, if statements, for and while loops, functions, one-dimensional arrays, and the cout and cin objects. After students have gained some experience with programming using these constructs, the topics are later revisited in greater detail, leading up to the important topic of classes and object-oriented programming. Throughout the text Ortega and Grimshaw emphasize the basic paradigms for constructing good programs and detecting errors.



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Bibliography

- Sales Rank: #1912678 in Books
- Published on: 1998-08-06
- Original language: English
- Number of items: 1
- Dimensions: 7.40" h x .60" w x 9.10" l, 1.10 pounds
- Binding: Paperback
- 288 pages

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Editorial Review

Review

"An excellent introduction to both C++ and numerical methods. The writing is clear, concise, and very readable. A great book!"--Anton Kruger, The University of Iowa

"Ortega and Grimshaw direct their book toward undergraduate students taking a course of study in numerical methods. Unlike many earlier books written for use with the BASIC or FORTRAN programming languages, this one gives the reader an introduction to implementing numerical methods using C++.

Since C++ is likely one of the more widely used languages of the current day in engineering and science, this treatment is very appropriate. No previous programming experience is required to use this book. The authors take a very gentle and gradual approach to introducing programming concepts.

Nevertheless, a significant number of numerical methods are covered . . . The quality of the presentation is high, and the book includes a generous number of figures and tables. Undergraduates."--Choice

"This is an excellent text and the Instructor's Manual is very helpful. The numerous examples from engineering make this the best text for engineering courses in C++."--Rolph W. Pike, Louisiana State University

About the Author

James Ortega and Andrew Grimshaw are both in the Computer Science Department, University of Virginia.

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