

1. Record Nr.	UNINA9910739414203321
Autore	Corless Robert M
Titolo	A Graduate Introduction to Numerical Methods : From the Viewpoint of Backward Error Analysis // by Robert M. Corless, Nicolas Fillion
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 2013
ISBN	1-4614-8453-7
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (XXXIX, 869 p. 194 illus., 10 illus. in color.)
Disciplina	004.0151
Soggetti	Computer science - Mathematics Numerical analysis Computational Mathematics and Numerical Analysis Computational Science and Engineering Numerical Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di contenuto	Computer Arithmetic & Fundamental Concepts of Computation -- Polynomials and Series -- Rootfinding and Function Evaluation -- Solving $Ax = b$ -- Solving $Ax = x$ -- Structured Linear Systems. -- Iterative Methods -- Polynomial and Rational Interpolation -- The Discrete Fourier Transform -- Numerical Integration -- Numerical Differentiation and Finite Differences -- Numerical Solution of ODEs -- Numerical Methods for ODEs -- Numerical Solutions of Boundary Value Problems -- Numerical Solution of Delay DEs -- Numerical Solution of PDEs.
Sommario/riassunto	This book provides an extensive introduction to numerical computing from the viewpoint of backward error analysis. The intended audience includes students and researchers in science, engineering and mathematics. The approach taken is somewhat informal owing to the wide variety of backgrounds of the readers, but the central ideas of backward error and sensitivity (conditioning) are systematically emphasized. The book is divided into four parts: Part I provides the background preliminaries including floating-point arithmetic, polynomials and computer evaluation of functions; Part II covers numerical linear algebra; Part III covers interpolation, the FFT and

quadrature; and Part IV covers numerical solutions of differential equations including initial-value problems, boundary-value problems, delay differential equations and a brief chapter on partial differential equations. The book contains detailed illustrations, chapter summaries and a variety of exercises as well as some Matlab codes provided online as supplementary material. "I really like the focus on backward error analysis and condition. This is novel in a textbook and a practical approach that will bring welcome attention." Lawrence F. Shampine.

---