1. Record Nr.   UNINA9911006839503321

   Autore   Ascher U. M (Uri M.), <1946->

   Titolo   A first course in numerical methods / / Uri M. Ascher, Chen Greif

   Pubbl/distr/stampa Philadelphia, Pa., : Society for Industrial and Applied Mathematics
                       (SIAM, 3600 Market Street, Floor 6, Philadelphia, PA 19104), 2011

   ISBN   1-68015-785-X
                       0-89871-998-4

   Descrizione fisica 1 online resource (xxii, 552 p. : |b ill. (some col.))

   Collana   Computational science and engineering series

   Altri autori (Persone) GreifChen <1965->

   Disciplina   518/.4

   Soggetti   Numerical calculations - Data processing
                       Numerical analysis
                       Algorithms

   Lingua di pubblicazione Inglese

   Formato   Materiale a stampa

   Livello bibliografico Monografia

   Note generali   Bibliographic Level Mode of Issuance: Monograph

   Nota di bibliografia Includes bibliographical references and index.

   Nota di contenuto   List of figures -- List of tables -- Preface -- Chapter 1. Numerical
                       algorithms -- Chapter 2. Roundoff errors -- Chapter 3. Nonlinear
                       equations in one variable -- Chapter 4. Linear algebra background --
                       Chapter 5. Linear systems: direct methods -- Chapter 6. Linear least
                       squares problems -- Chapter 7. Linear systems: iterative methods --
                       Chapter 8. Eigenvalues and singular values -- Chapter 9. Nonlinear
                       systems and optimization -- Chapter 10. Polynomial interpolation --
                       Chapter 11. Piecewise polynomial interpolation -- Chapter 12. Best
                       approximation -- Chapter 13. Fourier Transform -- Chapter 14.
                       Numerical differentiation -- Chapter 15. Numerical integration --
                       Chapter 16. Differential equations -- Bibliography -- Index.

   Sommario/riassunto This book is designed for students and researchers who seek practical
                       knowledge of modern techniques in scientific computing. Avoiding
                       encyclopedic and heavily theoretical exposition, the book provides an
                       in-depth treatment of fundamental issues and methods, the reasons
                       behind the success and failure of numerical software, and fresh and
                       easy-to-follow approaches and techniques. The authors focus on
                       current methods, issues, and software while providing a comprehensive
                       theoretical foundation, enabling those who need to apply the
                       techniques to successfully design solutions to nonstandard problems.

The book also illustrates algorithms using the programming environment of MATLAB®, with the expectation that the reader will gradually become proficient in it while learning the material covered in the book. A variety of exercises are provided within each chapter along with review questions aimed at self-testing. The book takes an algorithmic approach, focusing on techniques that have a high level of applicability to engineering, computer science, and industrial mathematics.