

1. Record Nr.	UNINA9910141239503321
Autore	Allen Myron B. <1954->
Titolo	Numerical analysis for applied science / / Myron B. Allen III, Eli L. Isaacson
Pubbl/distr/stampa	New York, New York : , : John Wiley & Sons, Inc., , 1998 ©1998
ISBN	1-118-03312-4 1-118-03027-3
Descrizione fisica	1 online resource (512 p.)
Collana	Pure and Applied Mathematics: A Wiley-Interscience Series of Texts, Monographs and Tracts
Disciplina	515
Soggetti	Numerical analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"A Wiley-Interscience Publication."
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Numerical Analysis for Applied Science; CONTENTS; Preface; 0 Some Useful Tools; 0.1 Introduction; 0.2 Bounded Sets; 0.3 Normed Vector Spaces; 0.4 Results from Calculus; 0.5 Problems; 0.6 References; 1 Approximation of Functions; 1.1 Introduction; 1.2 Polynomial Interpolation; 1.3 Piecewise Polynomial Interpolation; 1.4 Hermite Interpolation; 1.5 Interpolation in Two Dimensions; 1.6 Splines; 1.7 Least-Squares Methods; 1.8 Trigonometric Interpolation; 1.9 Problems; 1.10 References; 2 Direct Methods for Linear Systems; 2.1 Introduction; 2.2 Gauss Elimination; 2.3 Variants of Gauss Elimination; 2.4 Band Matrices; 2.5 Matrix Norms; 2.6 Errors and Iterative Improvement; 2.7 Problems; 2.8 References; 3 Solution of Nonlinear Equations; 3.1 Introduction; 3.2 Bisection; 3.3 Successive Substitution in One Variable; 3.4 Newton's Method in One Variable; 3.5 The Secant Method; 3.6 Successive Substitution: Several Variables; 3.7 Newton's Method: Several Variables; 3.8 Problems; 3.9 References; 4 Iterative Methods for Linear Systems; 4.1 Introduction; 4.2 Conceptual Foundations; 4.3 Matrix-Splitting Techniques; 4.4 Successive Overrelaxation; 4.5 The Conjugate-Gradient Method; 4.6 Problems; 4.7 References; 5 Eigenvalue Problems; 5.1 Basic Facts About Eigenvalues; 5.2 Power Methods; 5.3 The QR Method: Underlying

Concepts; 5.4 The QR Method Implementation; 5.5 Problems; 5.6 References; 6 Numerical Integration; 6.1 Introduction; 6.2 Newton-Cotes Formulas; 6.3 Romberg and Adaptive Quadrature; 6.4 Gauss Quadrature; 6.5 Problems; 6.6 References; 7 Ordinary Differential Equations; 7.1 Introduction; 7.2 One-Step Methods; 7.3 Multistep Methods: Consistency and Stability; 7.4 Convergence of Multistep Methods; 7.5 Problems; 7.6 References; 8 Difference Methods for PDEs; 8.1 Introduction
8.2 The Poisson Equation
8.3 The Advection Equation; 8.4 Other Time-Dependent Equations; 8.5 Problems; 8.6 References; 9 Introduction to Finite Elements; 9.1 Introduction and Background; 9.2 A Steady-State Problem; 9.3 A Transient Problem; 9.4 Problems; 9.5 References; Appendix A: Divided Differences; Appendix B: Local Minima; Appendix C: Chebyshev Polynomials; Index

Sommario/riassunto

Written for graduate students in applied mathematics, engineering and science courses, the purpose of this book is to present topics in ""Numerical Analysis"" and ""Numerical Methods."". It will combine the material of both these areas as well as special topics in modern applications. Included at the end of each chapter are a variety of theoretical and computational exercises.
